Split Water Source Heat Pump And Cooling Only Unit

Models: MWSC 010 B/BR MWSC 025 B/BR
MWSC 015 B/BR MWSC 030 B/BR
MWSC 020 B/BR MWSC 050 B/BR

McQuay® Air Conditioning

Contents

Features 2

Specifications 4

Outlines And Dimensions 7

Electrical Connection And Parameter 15

Installation Of Indoor Unit 25

Installation Of Outdoor Unit 36

Vacuuming And Charging Method 42

Overall Checking 44

Remote Control Operation Guide 45

Standard Operation Conditions 47

Start-up 47

Servicing And Maintenance 48

Cleaning & Flushing System 50

Troubleshooting 51

Note: Installation and maintenance are to be performed only by qualified personnel who are familiar with local codes and regulations, and experienced with this type of equipment.

Caution: Sharp edges and coil surfaces are a potential injury hazard. Avoid contact with them.

Warning: Moving machinery and electrical power hazard. May cause severe personal injury or death. Disconnect and lock off power before servicing equipment.

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Features

Save Energy

This decentralized, year-round heating and cooling system consists of a two-pipe closed loop water circuit, through which non-refrigerated water circulates continuously throughout the building. Locating the piping within the building negates the need of for piping insulation. These systems achieve energy conservation by pumping heat from warm to cold spaces whenever they coexist anywhere within the building. On demand for heating a space, the conditioner will absorb heat from the loop circuit, whereas on demand for cooling a space, the conditioner will reject heat to the loop circuit. The system provides the essential benefit of decentralized and individual choice of heating or cooling. The occupant may select heating or cooling or shut off the conditioner, serving an individual space without affecting conditioners operated in other spaces. The occupant may realize this freely at any time of the day or year.

Flexible Investment

The period of the project installing is short and the original cost of investment is low. It is convenient to install according to occupant demand.

Convenient Control

Each room can be controlled individually without affecting the other space.

High Efficiency

The unit is operated in high efficiency and saves running cost due to water as cooling and heating media.

Running Quiet

The unit is designed into split configuration which is a thorough solution to the noise problem. The indoor unit can be installed wherever is suitable. The outdoor unit can be placed on outside of the wall or the ceiling, at the balcony or aisle. It is an ideal device for home, industrial or commercial place due to its low noise.

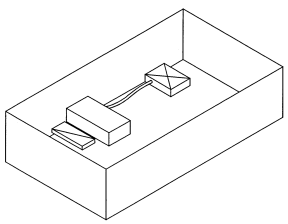
Elegant, Neat And Tidy

While the rest of the unit is concealed, the wall or ceiling air grilles is exposed. This design concept has in mind: (a) aesthetic beauty (b) optimum space utilization. It is ideal for office, hotel, hospital and restaurants application.

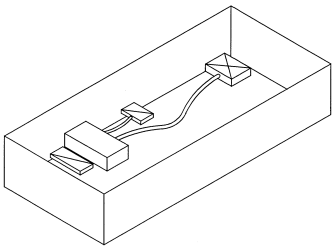
Easy And Flexible Installation

The physical height of the unit is only 224 mm, and only a clearance of 75 mm between any beam and the false ceiling is required. It is therefore offering greatest flexibility in selecting installation location.

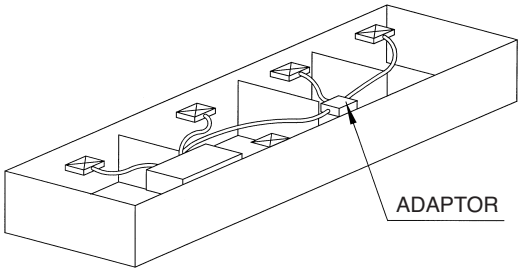
ROOM LAYOUT 1



ROOM LAYOUT 2



ROOM LAYOUT 3



Microcomputer remote control

The microcomputer remote control has following functions

- Five optional operation modes (heat/cool/dry/fan/auto).
- Fan speed can be set at high, medium, low and automatic.
- Sleep mode automatically increase set temperature since temperature is lower at night thus achieving healthy sleep.
- Microcomputer controlled thermostat precisely controls room temperature resulting in energy saving and increases comfort.
- Hot start and hot keep mode do not supply air for 30 sec. After deicing as well as initial operation of heating mode. This prevents cold draft and maintains the indoor comfort.
- Timer on/off can be preset for the maximum of 15 hours.

Easy maintenance

This simple design concept has a friendly maintenance and servicing in mind. Access to all the internal parts of the unit can be from either side panels or the top panel of the unit by loosening a few screws.

Specifications

Ceiling Concealed Heat Pump Models

Model		Indoor unit	MCC010M	MCC010MR	MCC015M	MCC015MR	MCC020M	MCC020MR	MCC025M	MCC025MR	MCC030M	MCC030MR	MCC050M	MCC050MR
		Outdoor unit	MWSC010B	MWSC010BR	MWSC015B	MWSC015BR	MWSC020B	MWSC020BR	MWSC025B	MWSC025BR	MWSC030B	MWSC030BR	MWSC050B	MWSC050BR
Rated cooling capacity		W	2700		4200		5600		6900		8200		12300	
Rated heating capacity		W	---	3000	---	4300	---	5600	---	7800	---	10500	---	15000
Air flow		m^3/h	550		760		1150		1400		1700		2040	
Power source		V/Ph/Hz	220V~/50Hz										380V/3N~/50Hz	
Indoor Unit	External static pressure	Pa	0, 15, 30, 50								15, 30, 50, 70			
Indoor Unit	Dimension length x wide x high	mm	830x566x224		930x566x224		1290x560x250		1290x560x250		1640x560x250		1900x560x250	
Indoor Unit	Weight	kg	25		30		36		36		48		59	
Indoor Unit	Sound level	dB(A)	38		38		42		49		43		46	
Outdoor Unit	Compressor model		ROTARY										SCROLL	
Outdoor Unit	Condenser	Type	TUBE IN TUBE						BPHE					
Outdoor Unit	Condenser	Water flow m^3/h	0.56		0.8		1.1		1.3		1.6		2.5	
Outdoor Unit	Condenser	Water pressure drop kPa	7.8		11		16.6		14		12		20	
Outdoor Unit	Condenser	Piping size in	Rc1/2								Rc3/4		G3/4	
Outdoor Unit	Dimension length x wide x high	mm	736x411x437								802x421x548		839x498x545	
Outdoor Unit	Weight	kg	51	52	56	57	62	63	63	64	74	75	84	85
Outdoor Unit	Sound level	dB(A)	34		37		41		41		41		42	
Rated power	Cooling	W	740	740	1170	1170	1635	1635	1800	1950	2350	2350	3140	3460
Rated power	Heating	W	---	725	---	1100	---	1470	---	1840	---	2360	---	3500
Rated current	Cooling	A	3.5		5.5		7.5	7.6	8.3	9.0	11.1	10.8	5.7	7.0
Rated current	Heating	A	---	3.4	---	5.2	---	6.8	---	8.6	---	10.8	---	7.3
Refrigerant			R22											
Refrigerant	Charge	kg	0.6	0.65	0.8	0.85	1.0	1.15	0.85	1.05	2.4	2.4	2.95	3.15
Piping size	Liquid pipe	Φmm(in)	6.35(1/4")		6.35(1/4")		6.35(1/4")		9.52(3/8")		9.52(3/8")		9.52(3/8")	
Piping size	Gas pipe	Φmm(in)	9.52(3/8")		12.7(1/2")		15.88(5/8")		15.88(5/8")		15.88(5/8")		19.05(3/4")	

Note: 1 specification will be subjected to change by manufacturer without prior notice.
2 cooling capacity is based on 26.7°C(DB),19.4°C(WB) entering air temperature and 29.4°C entering water temperature,35°C leaving water temperature.
3 heating capacity is based on 21.1°C(DB),15.6°C(WB) entering air temperature and 21.1°C entering water temperature.

Ceiling Exposed Heat Pump Models

Model	Indoor Unit	MCM020D	MCM020DR	MCM030D	MCM030DR	MCM050D	MCM050DR
	Outdoor Unit	MWSC020B	MWSC020BR	MWSC030B	MWSC030BR	MWSC050B	MWSC050BR
Cooling Capacity(W)		5250	5250	8200	8200	12300	12300
Heating Capactiy(W)		-	5600	-	10500	-	14500
Power Source		220V~/50Hz				380V/3N~/50Hz	
Power Input(W)	Cooling	1495	1495	2350	2350	3060	3060
	Heating	-	1480	-	2360	-	3500
Rated Current(A)	Cooling	7.3	7.3	11.1	10.8	5.7	7.0
	Heating	-	6.8	-	10.8	-	7.3
Sound Level dB(A)	Indoor unit	48	48	50	50	52	52
	Outdoor unit	41	41	41	41	42	42
Refrigerant		R22					
Charge (kg)		1.0	1.0	2.8	2.98	3.4	3.4
Weight (kg)	Indoor Unit	39	39	44	44	64	64
	Outdoor Unit	62	63	91	92	84	85
Piping Size (mm)	Liquid pipe	6.35		9.52		9.52	
	Gas pipe	15.88		15.88		19.05	

Note: 1 specification will be subjected to change by manufacturer without prior notice.
2 cooling capacity is based on 26.7°C(DB),19.4°C(WB) entering air temperature and 29.4°C entering water temperature,35°C leaving water temperature.
3 heating capacity is based on 21.1°C(DB),15.6°C(WB) entering air temperature and 21.1°C entering water temperature.

Ceiling Cassette Heat Pump Models

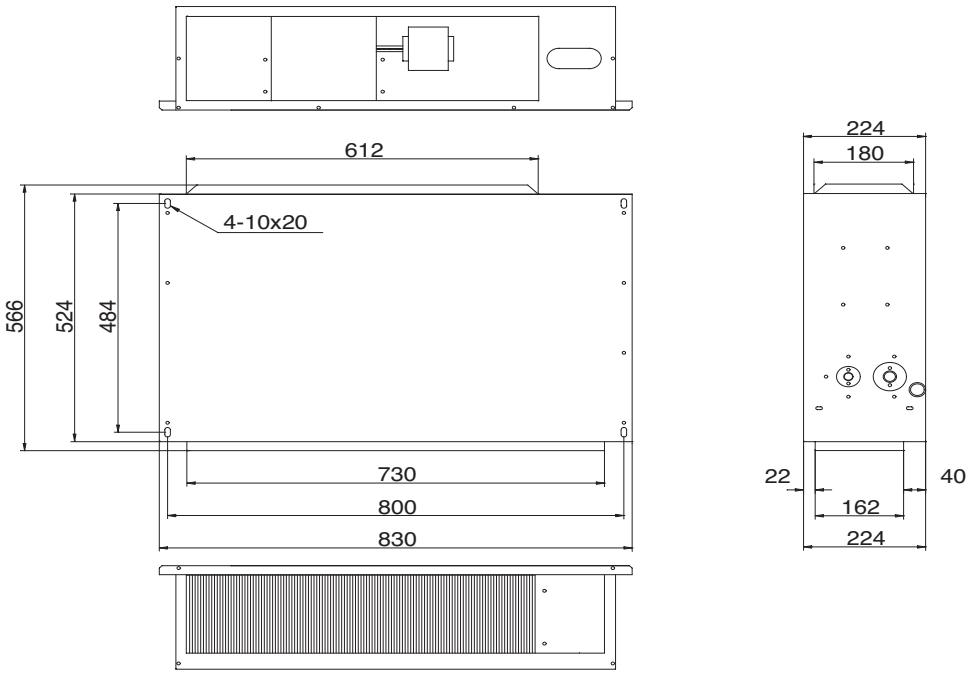
Indoor Unit			MCK 020A	MCK 020AR	MCK 030A	MCK 030AR	MCK 050A	MCK 050AR
Cooling Capacity		W	5,600		8,200		12,300	
Heating Capacity		W	—	5,600	—	10,500	—	14,500
Piping Size	Liquid Pipe	Φmm(in)	6.35 (1/4")		9.52 (3/8")		9.52 (3/8")	
	Gas Pipe	Φmm(in)	15.88 (5/8")		15.88 (5/8")		19.05 (3/4")	
Refrigerant			R22					
Power Source			220V~/50Hz					
Power Input	Cooling	W	1,400		2,370	2,370	3,060	3,060
	Heating	W	—	1,480	—	2,490	—	3,290
Air Flow		m^3/h	1,100		1,300		1,850	
Weight(Indoor Unit)		kg	37.5	37.5	39.5	39.5	39.5	39.5
ESP		Pa	0					
Sound Level		dB(A)	41		45		49	

Outdoor Unit			MWSC 020B	MWSC 020BR	MWSC 030B	MWSC 030BR	MWSC 050B	MWSC 050BR
Piping Size	Liquid Pipe	Φmm(in)	6.35 (1/4")		9.52 (3/8")		9.52 (3/8")	
	Gas Pipe	Φmm(in)	15.88 (5/8")		15.88 (5/8")		19.05 (3/4")	
Power Source			220V~/50Hz				380V/3N~/50Hz	
Protection Device			Pressure Protector				Overload. Phase and Pressure Protector	
Rated Current	Cooling	A	6.5		11.4	11.4	5.6	7.0
	Heating	A	—	7.1	—	12.1	—	7.3
Water Flow		m^3/h	1.15		1.5		2.37	
Water Pipe Size		in	Rc1/2		Rc3/4			
Weight(Outdoor Unit)		kg	62	63	91	92	84	85
Charge(R22)		kg	1.1	1.13	2.85	2.8	3.3	2.8
Sound Level		dB(A)	41		41		42	

Note: 1 specification will be subjected to change by manufacturer without prior notice.
2 cooling capacity is based on 26.7°C(DB),19.4°C(WB) entering air temperature and 29.4°C entering water temperature,35°C leaving water temperature.
3 heating capacity is based on 21.1°C(DB),15.6°C(WB) entering air temperature and 21.1°C entering water temperature.

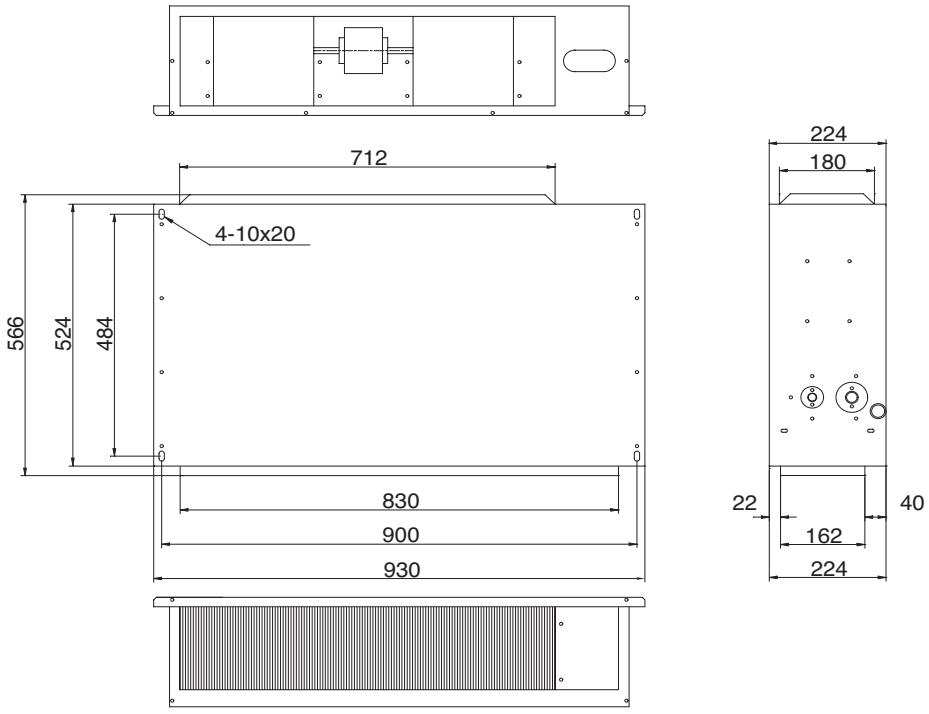
Outlines and Dimensions

Indoor unit model: MCC 010M /MCC 010MR



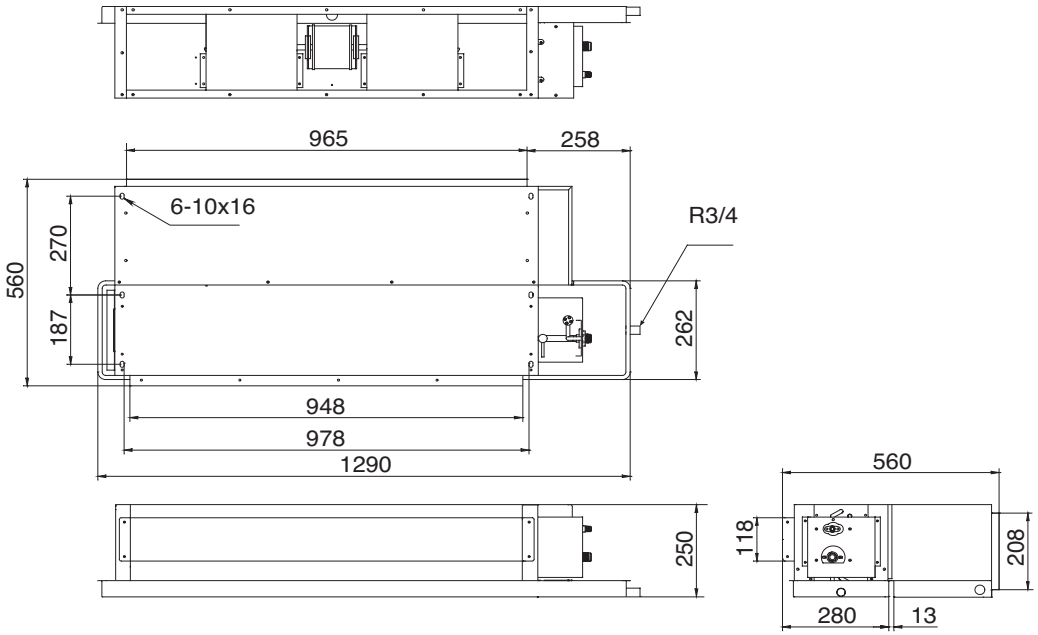
unit: mm

Indoor unit model: MCC 015M / MCC 015MR



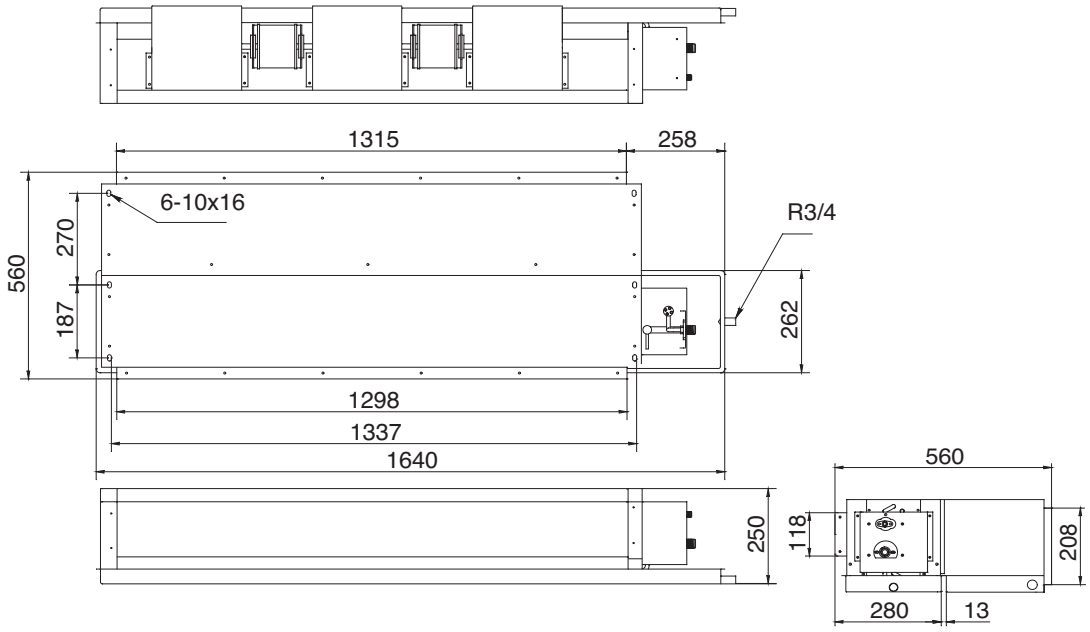
unit: mm

Indoor unit model: MCC 020M / MCC 020MR
MCC 025M / MCC 025MR



unit: mm

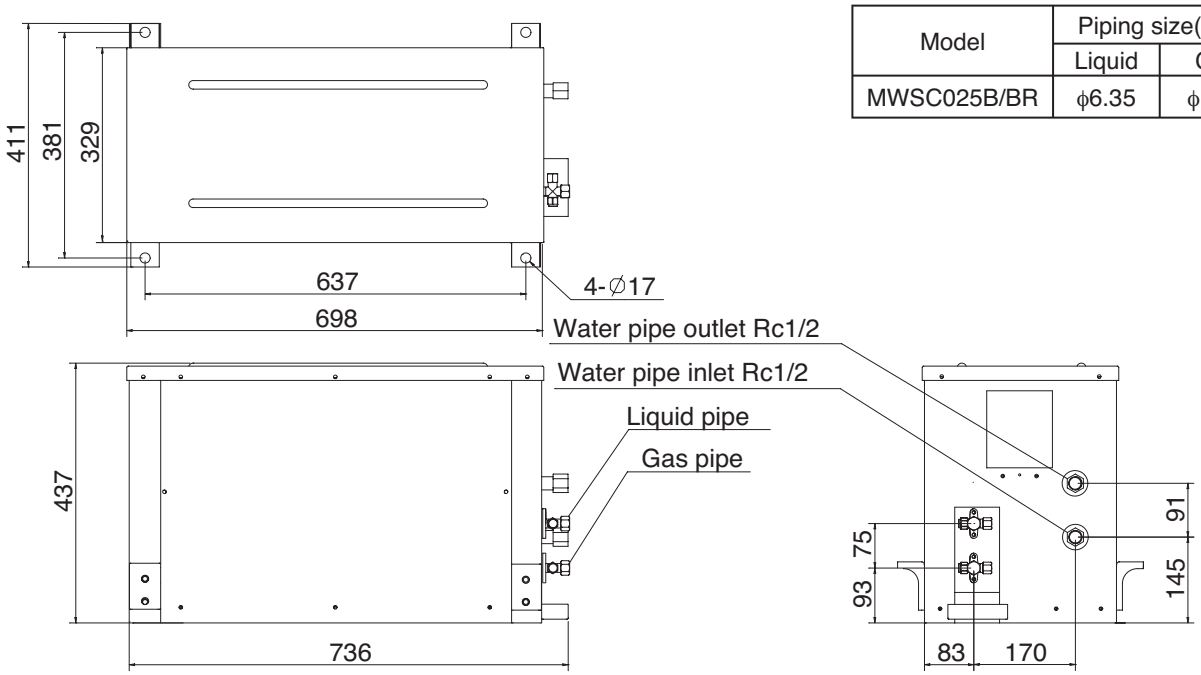
Indoor unit model: MCC 030M /MCC 030MR



unit: mm

Outdoor unit model: MWSC 015B/MWSC 015BR

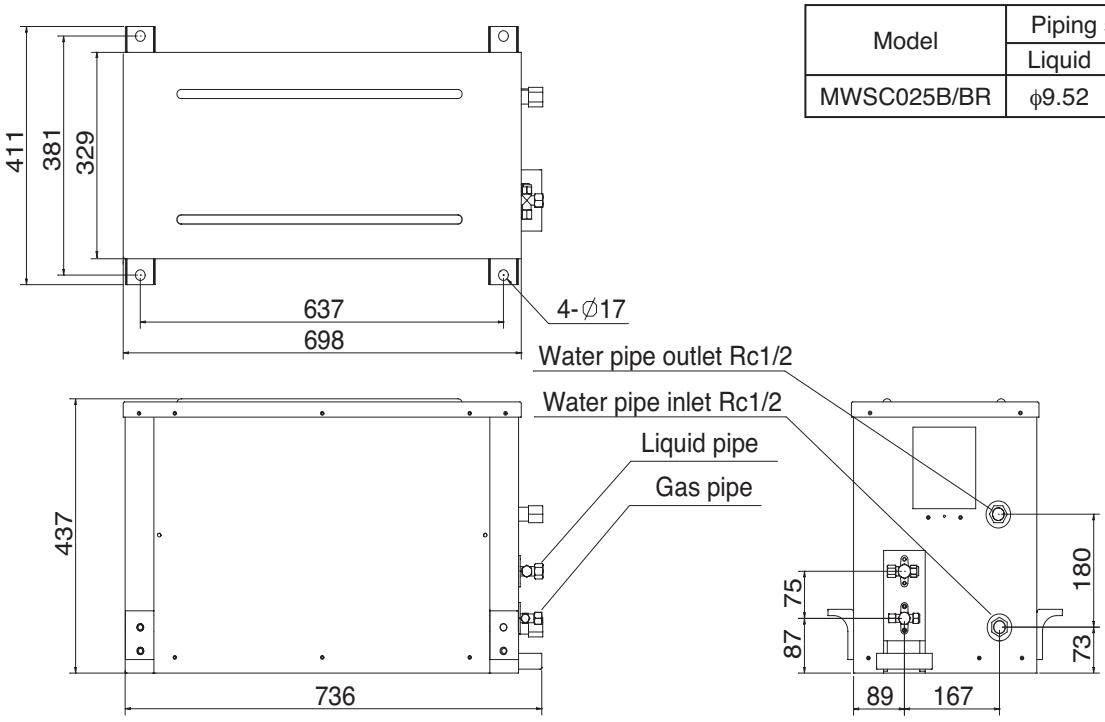
Model	Piping size(mm)	
	Liquid	Gas
MWSC025B/BR	ϕ6.35	ϕ12.7



unit: mm

Outdoor unit model: MWSC 020B/MWSC 020BR

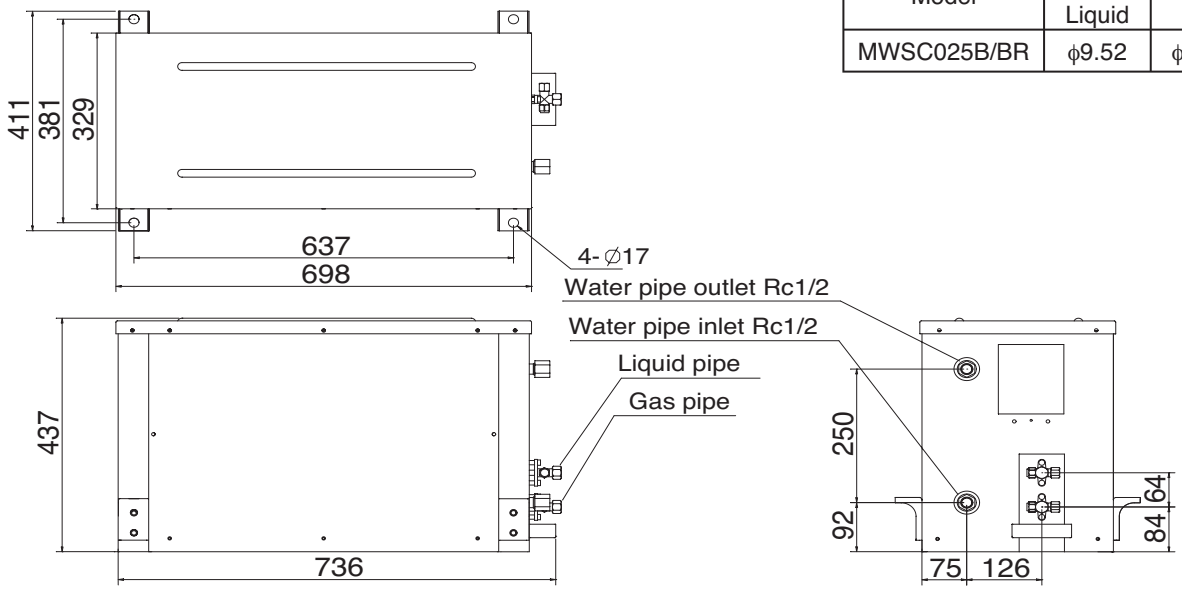
Model	Piping size(mm)	
	Liquid	Gas
MWSC025B/BR	ϕ9.52	ϕ15.88



unit: mm

Outdoor unit model: MWSC 025B/MWSC 025BR

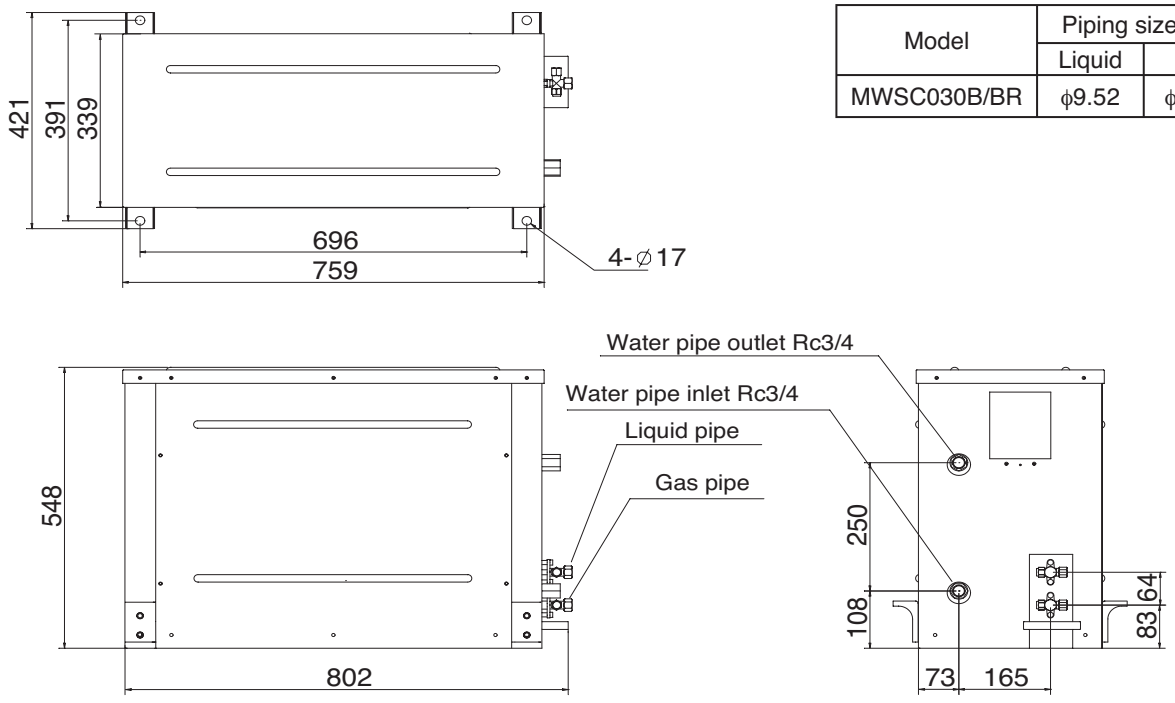
Model	Piping size(mm)	
	Liquid	Gas
MWSC025B/BR	ϕ9.52	ϕ15.88



unit: mm

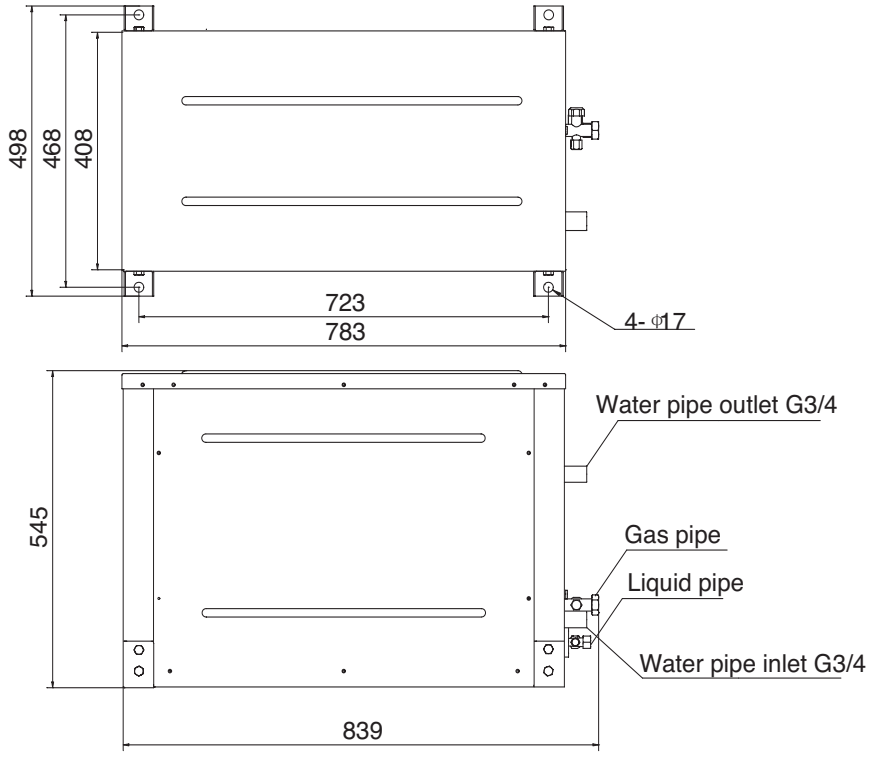
Outdoor unit model: MWSC 030B/MWSC 030BR

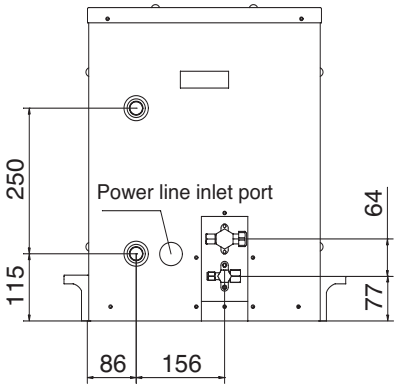
Model	Piping size(mm)	
	Liquid	Gas
MWSC030B/BR	ϕ9.52	ϕ15.88



unit: mm

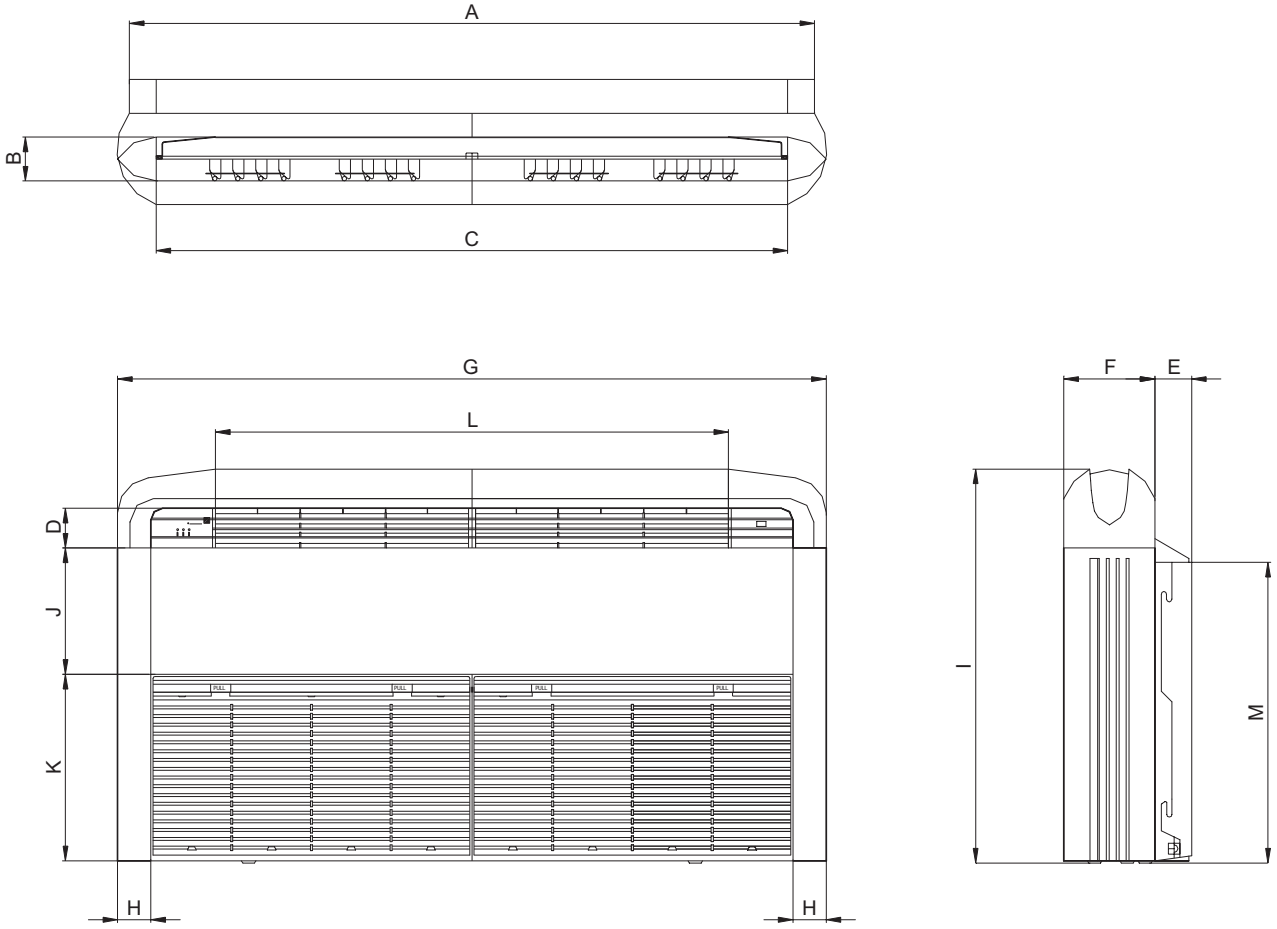
Outdoor unit model:MWSC 050B/MWSC 050BR





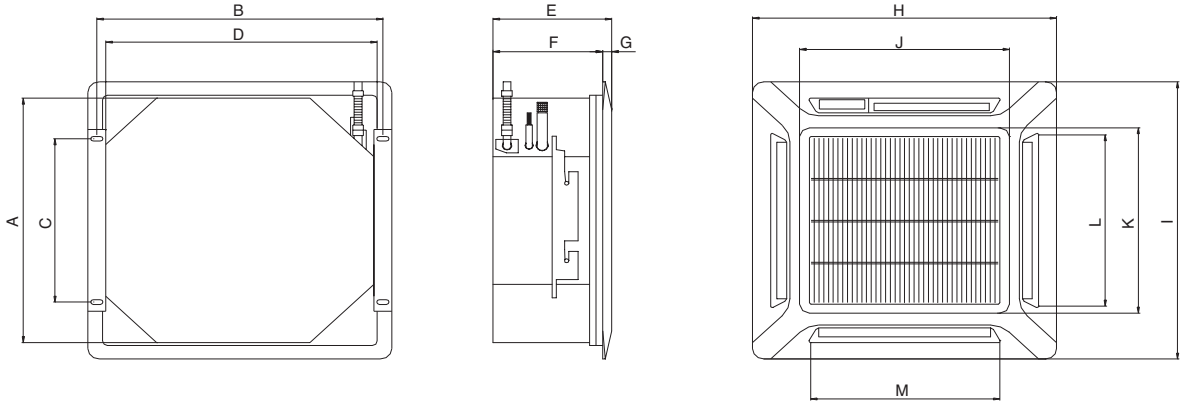
Model	Piping size(mm)	
	Liquid	Gas
MWSC050B/BR	ϕ9.52	ϕ19.05

Model : MCM 020 / 030 / 050 D
MCM 020 / 030 / 050 DR



MODEL	MCM 020D/DR	MCM 030D/DR	MCM 050D/DR
A	1174	1174	1674
B	75	75	75
C	1082	1082	1582
D	68	68	68
E	58	93	93
F	156	156	156
G	1214	1214	1714
H	57	57	57
I	670	670	670
J	216	216	216
K	319	319	319
L	879	879	1379
M	517	517	517

Model : MCK 020 / 030 / 050 A
MCK 020 / 030 / 050 AR



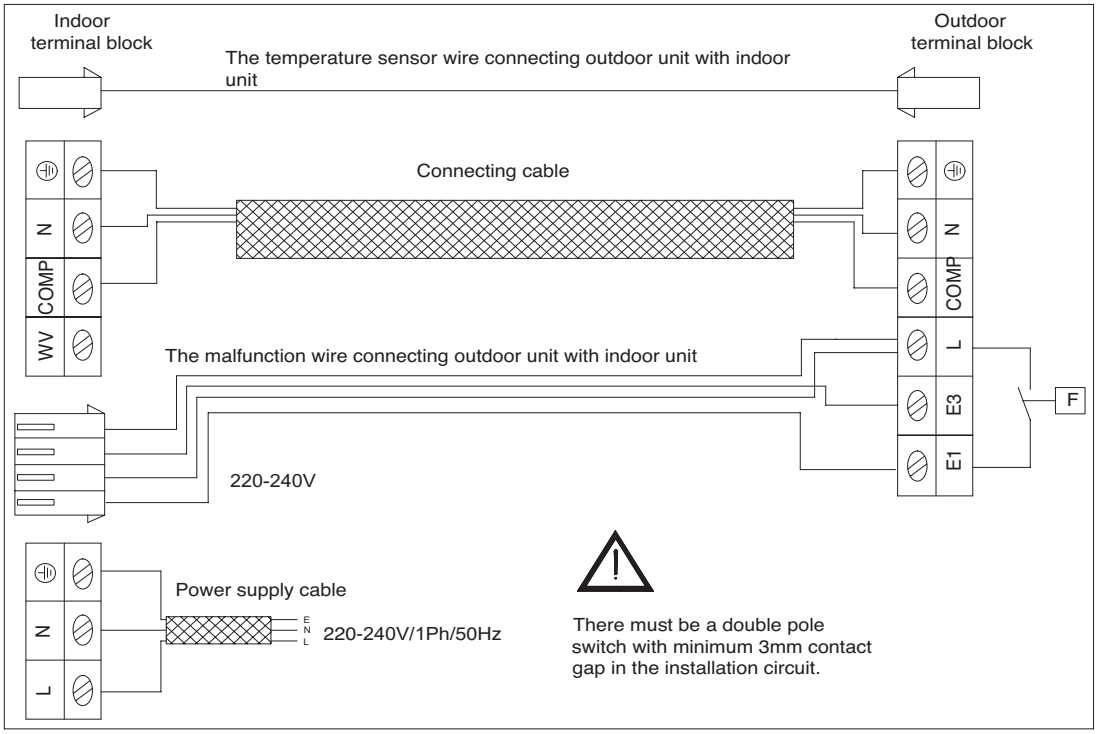
Note : Dimension in mm

Model	A	B	C	D	E	F	G	H	I	J	K	L	M
MCK020A/AR	820	875	548	820	363	335	28	930	930	642	622	555	555
MCK030A/AR	820	875	548	820	363	335	28	930	930	642	622	555	555
MCK050A/AR	820	875	548	820	363	335	28	930	930	642	622	555	555

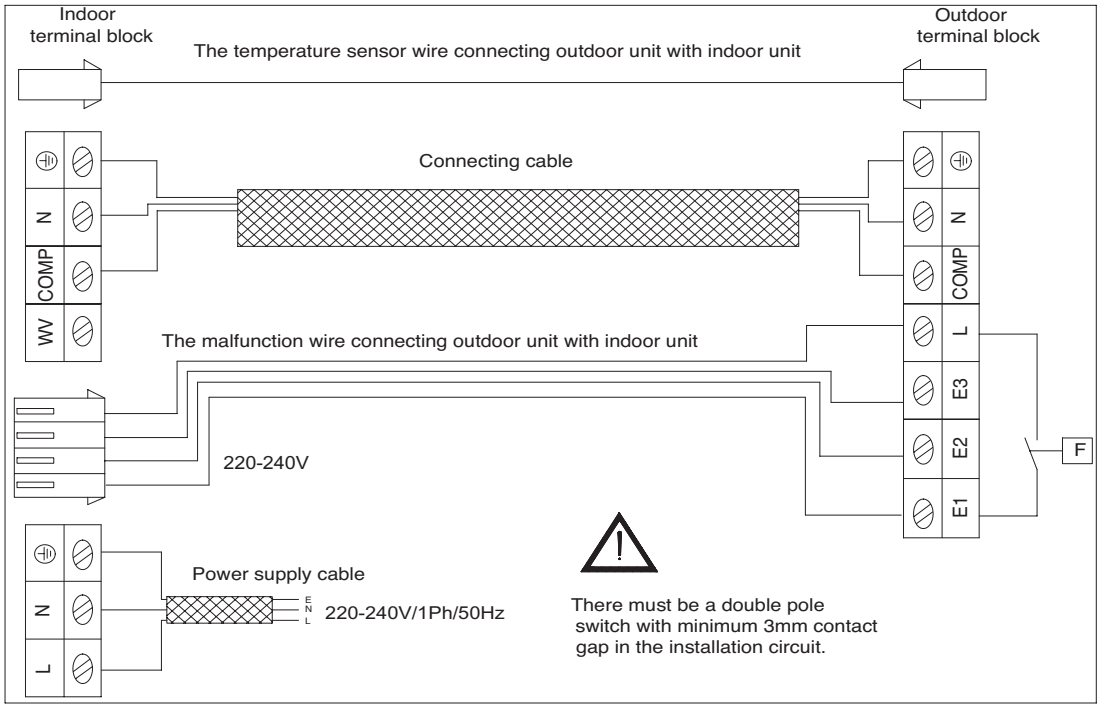
Electrical Connection and Parameter

1) Electrical connection

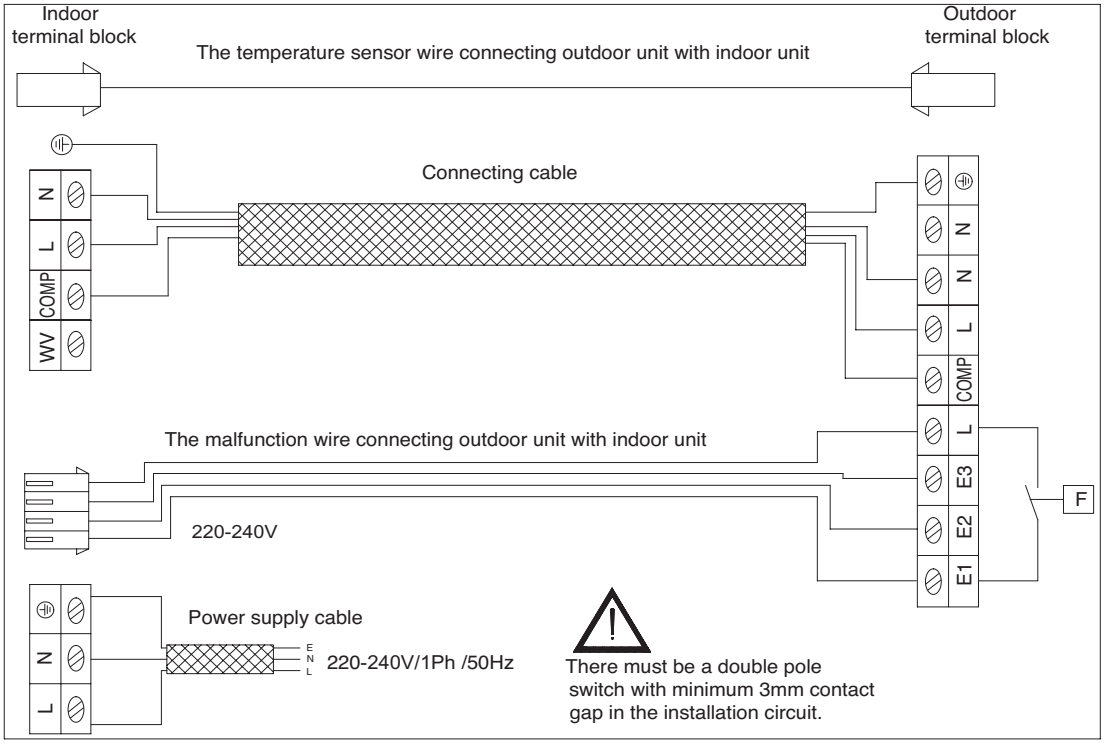
Model: MCC 010M / MWSC 010B
MCC 015M / MWSC 015B



Model: MCC020M/MWSC020B
MCC025M/MWSC025B



Model: MCC 030M / MWSC 030B



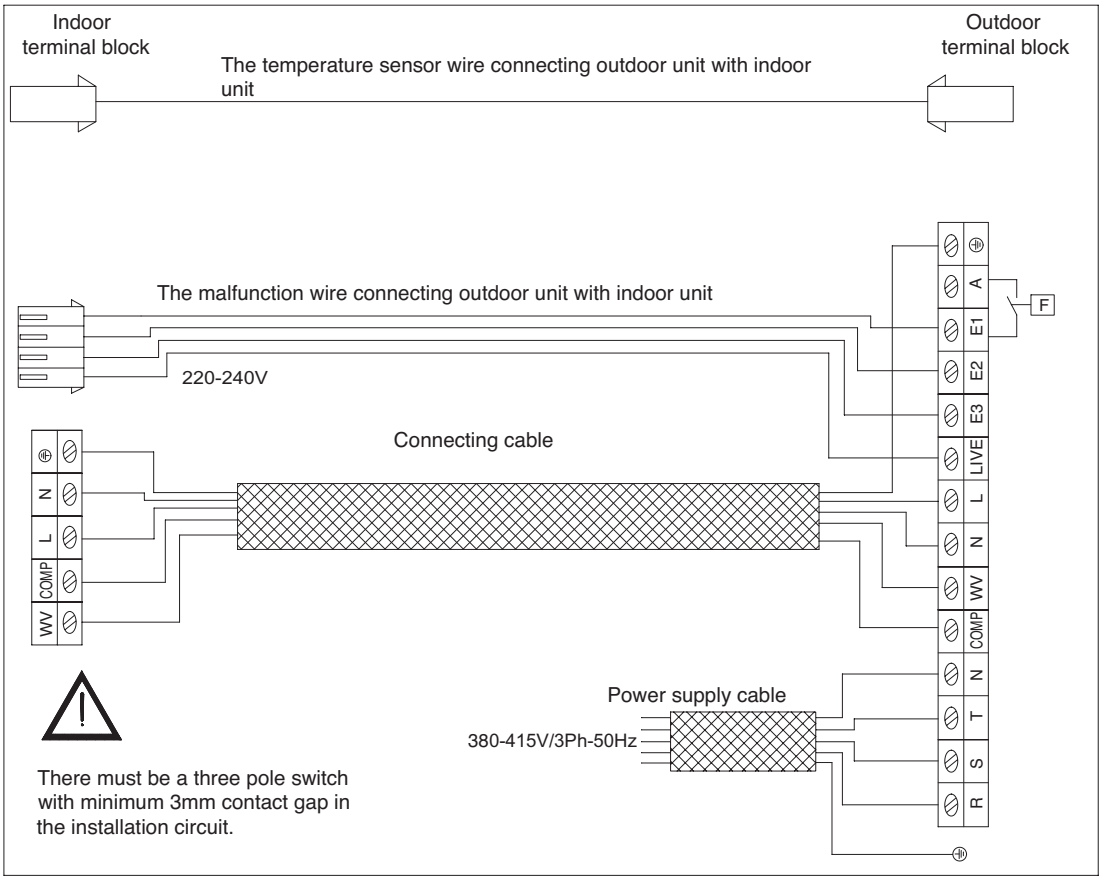
2) Electrical parameter

Model	Indoor unit	MCC 010M	MCC 015M	MCC 020M	MCC025M	MCC 030M	
	Outdoor unit	MWSC 010B	MWSC 015B	MWSC 020B	MWSC025B	MWSC 030B	
Power source		220V~/50Hz					
Power input(W)	Cooling	740	1,700	1,635	1,800	2,350	
Running current(A)	Cooling	3.5	5.5	7.5	8.3	11.1	
Power supply wire	Section area(mm^2)	2.5	2.5	2.5	2.5	2.5	
	Quantity	3	3	3	3	3	
Connecting cable	Section area(mm^2)	2.5	2.5	2.5	2.5	2.5	1.5
	Quantity	3	3	3	3	2	2

- The wiring must be firmly connected.
- Electric wiring must not touch the refrigerant pipe, compressor and moving parts of the fan motor.
- The wiring between indoor unit and outdoor unit must be fixed by clamp.
- All wiring between indoor unit and outdoor unit should be neoprene copper core, and section area of cable should be in accordance with above requirements.

Model: MCC 050M / MWSC 050B

1) Electrical connection



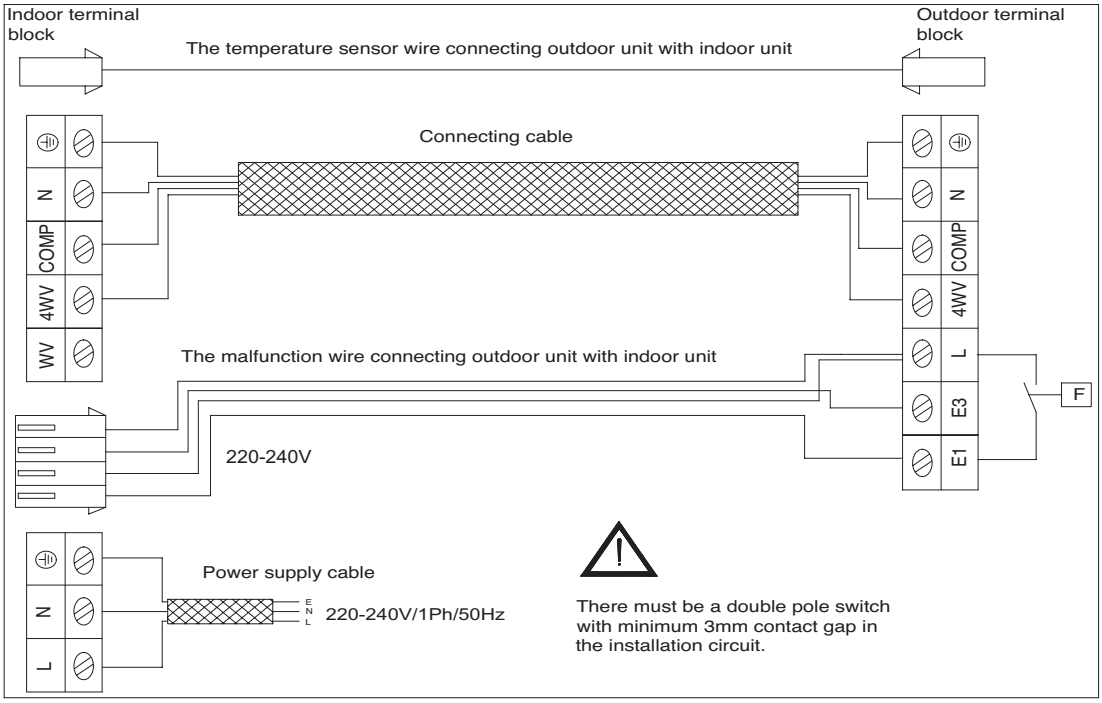
2) Electrical parameter

Model	Indoor unit	MCC 050M
	Outdoor unit	MWSC 050B
Power source		380V/3N~/50Hz
Power input(W)	Cooling	3,140
Running current(A)	Cooling	5.7
Power supply wire	Section area(mm²)	2.5
	Quantity	5
Connecting cable	Section area (mm²)	1.5
	Quantity	5

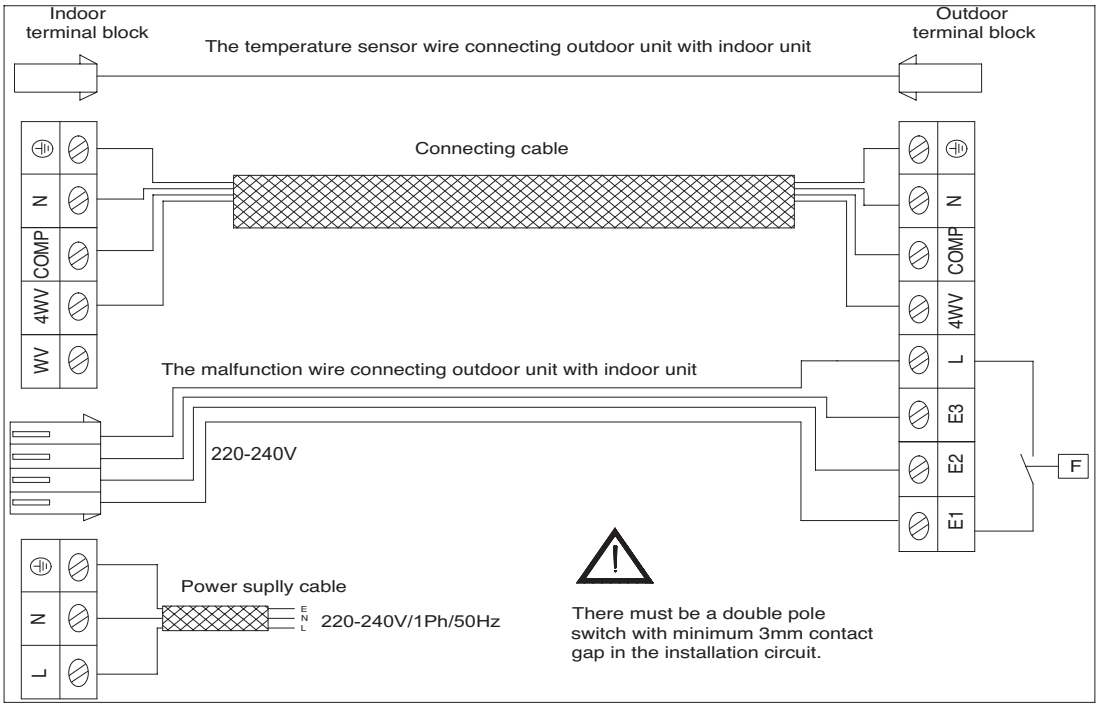
- The wiring must be firmly connected.
- Electric wiring must not touch the refrigerant pipe, compressor and moving parts of the fan motor.
- The wiring between indoor unit and outdoor unit must be fixed by clamp.
- All wiring between indoor unit and outdoor unit should be neoprene copper core, and section area of cable should be in accordance with above requirements.

1) Electrical connection

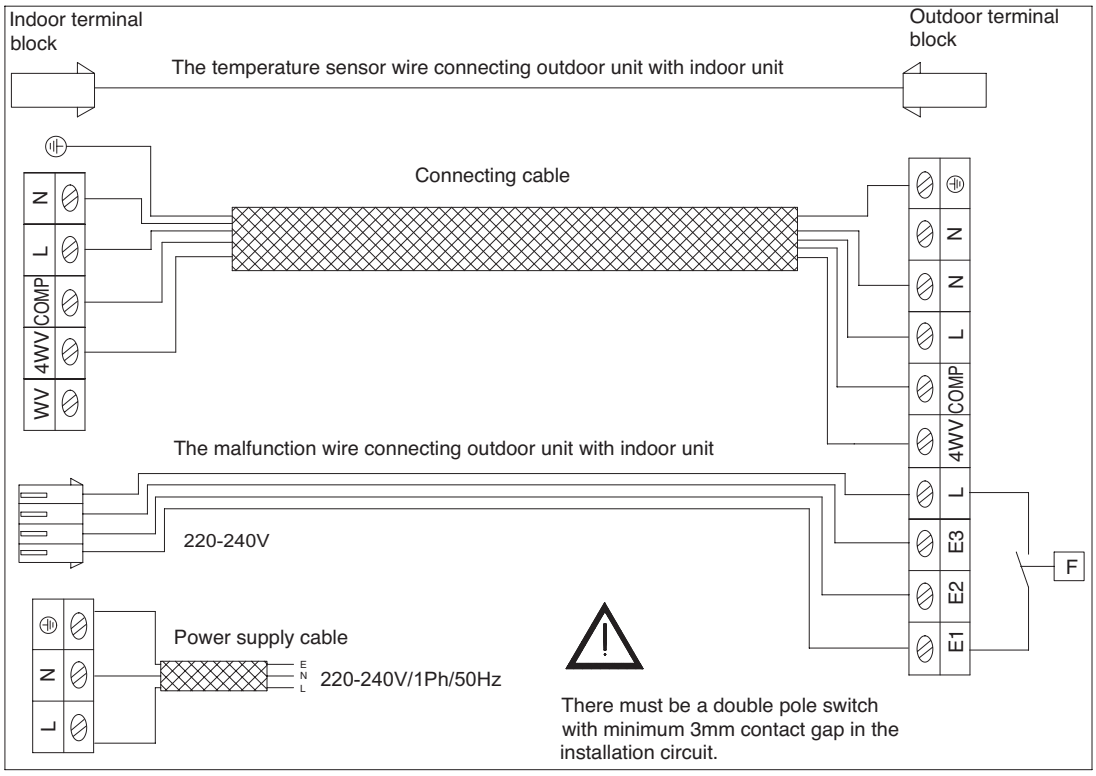
Model: MCC 010MR / MWSC 010BR
MCC 015MR / MWSC 015BR



Model: MCC 020MR / MWSC 020BR
MCC 025MR / MWSC 025BR



Model: MCC 030MR / MWSC 030BR



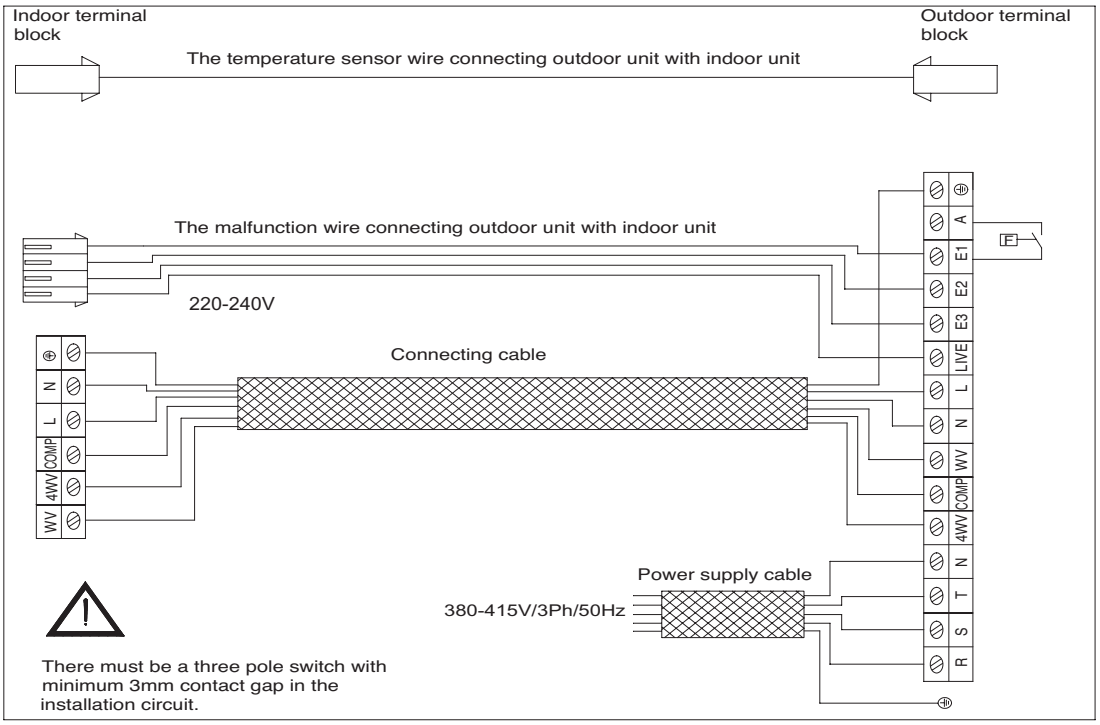
2) Electrical parameter

Model	Indoor unit	MCC 010MR		MCC 015MR		MCC 020MR		MCC025MR		MCC 030MR	
	Outdoor unit	MWSC 010BR		MWSC 015BR		MWSC 020BR		MWSC025BR		MWSC 030BR	
Power source		220V~/50Hz									
Power input (W)	Cooling	740		1,170		1,635		1,950		2,350	
	Heating	725		1,100		1,470		1,840		2,360	
Running current (A)	Cooling	3.5		5.5		7.6		9.0		10.8	
	Heating	3.4		5.2		6.8		8.6		10.8	
Power supply wire	Section area(mm²)	2.5		2.5		2.5		2.5		2.5	
	Quantity	3		3		3		3		3	
Connecting cable	Section area (mm²)	2.5	1.5	2.5	1.5	2.5	1.5	2.5	1.5	2.5	1.5
	Quantity	2	2	2	2	2	2	2	2	2	3

- The wiring must be firmly connected.
- Electric wiring must not touch the refrigerant pipe, compressor and moving parts of the fan motor.
- The wiring between indoor unit and outdoor unit must be fixed by clamp.
- All wiring between indoor unit and outdoor unit should be neoprene copper core, and section area of cable should be in accordance with above requirements.

Model: MCC 050MR / MWSC 050BR

1) Electrical connection



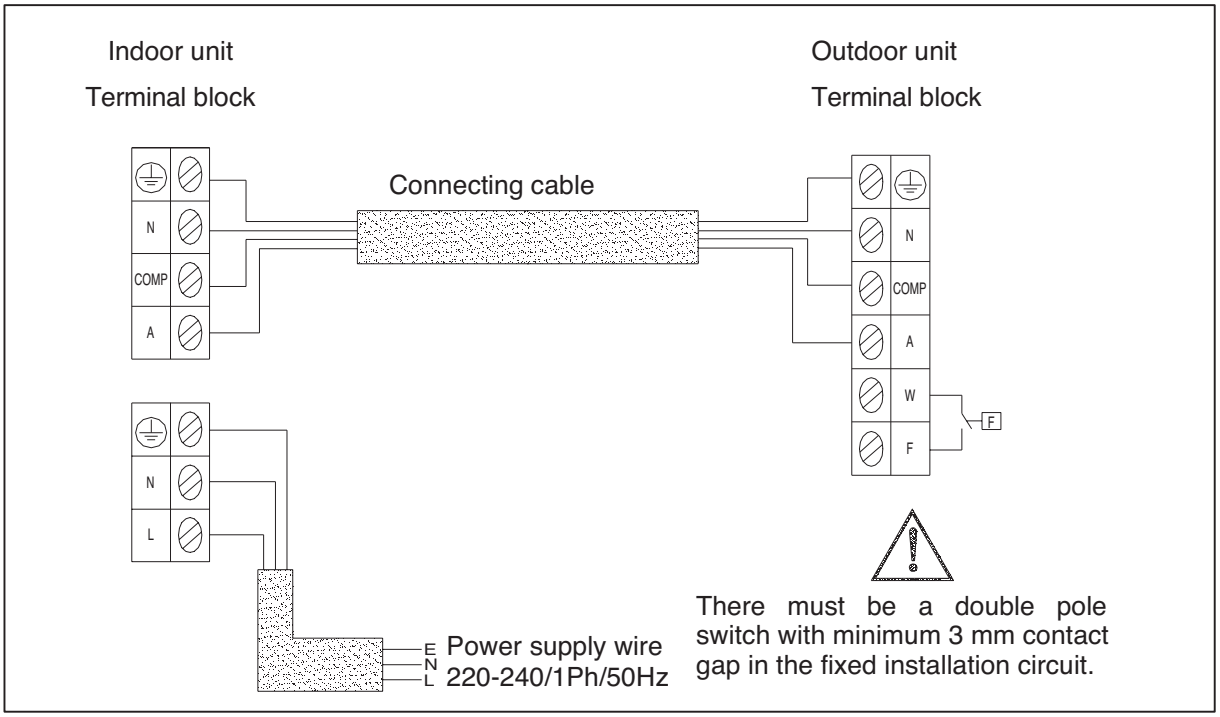
2) Electrical parameter

Model	Indoor unit	MCC 050MR
	Outdoor unit	MWSC 050BR
Power source		380V/3N~/50Hz
Power input (W)	Cooling	3,460
	Heating	3,500
Running current (A)	Cooling	7.0
	Heating	7.3
Power supply wire	Section area(mm^2)	2.5
	Quantity	5
Connecting cable	Section area (mm^2)	1.5
	Quantity	6

- The wiring must be firmly connected.
- Electric wiring must not touch the refrigerant pipe, compressor and moving parts of the fan motor.
- The wiring between indoor unit and outdoor unit must be fixed by clamp.
- All wiring between indoor unit and outdoor unit should be neoprene copper core, and section area of cable should be in accordance with above requirements.

Model : MCK 020A/ MWSC 020B MCK 030A/ MWSC 030B
MCM 020D/ MWSC 020B MCM 030D / MWSC 030B

1) Electrical connection

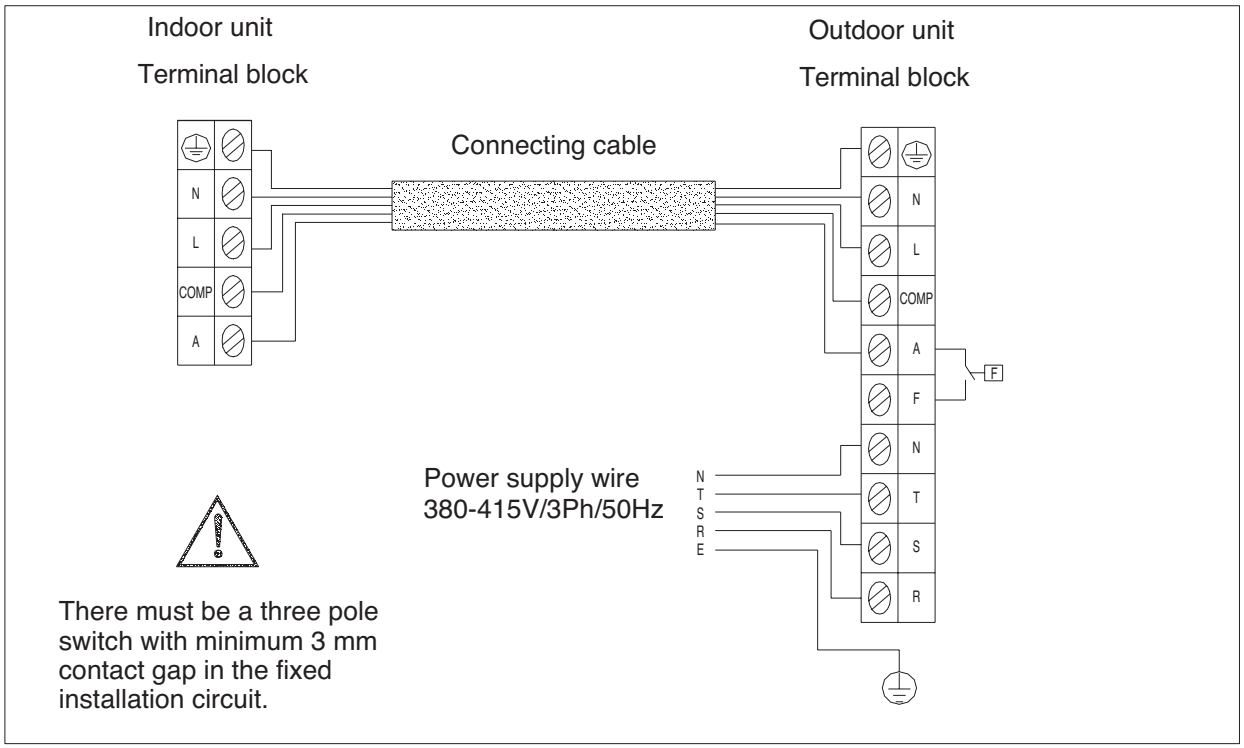


2) Electrical parameter

Model	Indoor unit	MCK 020A	MCK 030A	MCM 020D	MCM 030D
	Outdoor unit	MWSC 020B	MWSC 030B	MWSC 020B	MWSC 030B
Power source (V/Ph/Hz)		220-240 / 1 / 50			
Power input (W)	Cooling	1560	2480	1530	2250
Running current (A)	Cooling	7.1	12	7.1	10.5
Power supply wire	Section area(mm2)	3.3	3.3	4	4
	Quantity	3	3	3	3
Connecting cable	Section area(mm2)	3.3	3.3	4	4
	Quantity	4	4	4	4

Model : MCK 050A / MWSC 050B
MCM 050D / MWSC 050B

1) Electrical connection

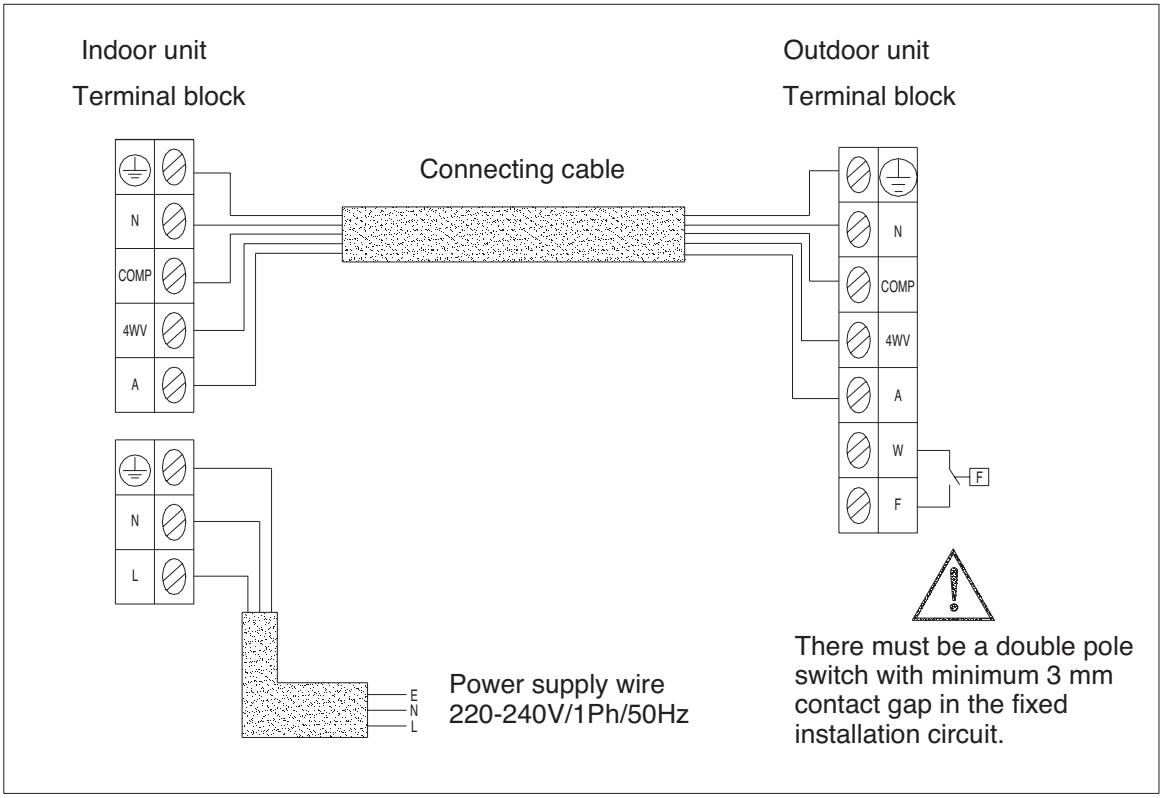


2) Electrical parameter

Model	Indoor unit	MCK 050A	MCM 050D
	Outdoor unit	MWSC 050B	MWSC 050B
Power source (V/Ph/Hz)		380-415 / 3 / 50	
Power input(W)	Cooling	3130	3280
Running current(A)	Heating	5.9	5.8
Power supply wire	Section area(mm^2)	3.3	4
	Quantity	5	5
Connecting cable	Section area (mm^2)	1.5	4
	Quantity	5	5

Model : MCK 020AR / MWSC 020BR MCK 030AR / MWSC 030BR
MCM 020DR / MWSC 020BR MCM 030DR / MWSC 030BR

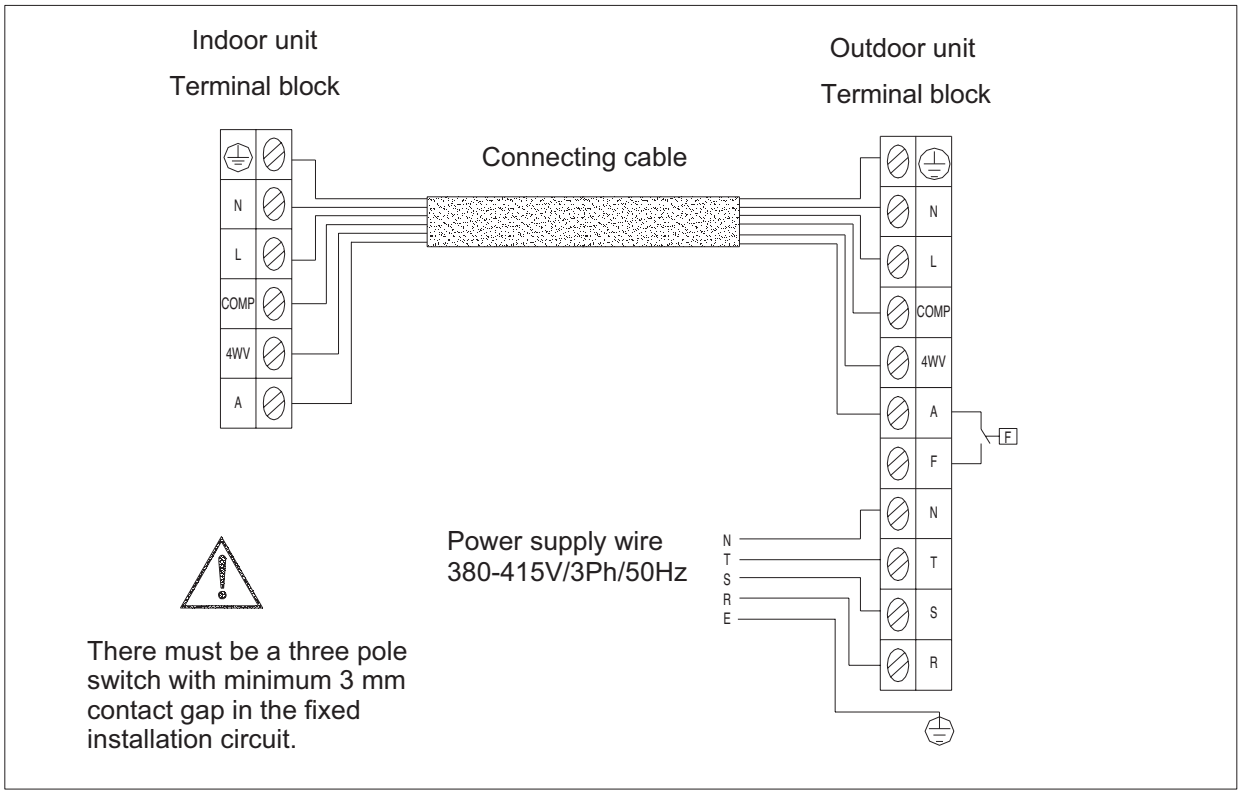
1) Electrical connection



2) Electrical parameter

Model	Indoor unit	MCK 020AR	MCK 030AR	MCM 020DR	MCM 030DR
	Outdoor unit	MWSC 020BR	MWSC 030BR	MWSC 020BR	MWSC 030BR
Power source (V/Ph/Hz)		220-240 / 1 / 50			
Power input (W)	Cooling	1560	2420	1530	2250
	Heating	1580	2445	1560	2460
Running current (A)	Cooling	7.1	11.8	7.0	10.2
	Heating	7.2	11.9	7.2	11
Power supply wire	Section area(mm²)	2.0	3.3	4	4
	Quantity	3	3	3	3
Connecting cable	Section area (mm²)	3.3	3.3	4	4
	Quantity	5	5	5	5

Model : MCK 050AR / MWSC 050BR
MCM 050DR / MWSC 050BR



2) Electrical parameter

Model	Indoor unit	MCK 050AR	MCM 050DR
	Outdoor unit	MWSC 050BR	MWSC 050BR
Power source (V/Ph/Hz)		380-415 / 3 / 50	
Power input(W)	Cooling	3460	3280
	Heating	3580	3560
Running current(A)	Cooling	6.3	5.8
	Heating	6.4	6.4
Power supply wire	Section area(mm^2)	3.3	4
	Quantity	5	5
Connecting cable	Section area (mm^2)	1.5	4
	Quantity	6	6

Installation Of Indoor Unit

Installation of MCC unit

1) Preliminary site survey

Electrical supply and installation is to conform to local authority's codes and regulations (e.g. National Electricity Board), Voltage supply fluctuation must not exceed ± 10% voltage. Voltage supply lines must be independent of welding transformers which can cause high voltage fluctuation. Ensure that the location is convenient for wiring and piping.

2) Installation of indoor units

The indoor unit must be installed such that there is no short circuit of the cool discharge, comply to the installation clearance recommended and make sure the location is suitable for piping and drainage.

The precaution steps:

I. Use the hanger supplied with the unit.

II. Ensure the support is stronger enough to withstand the weight of the unit.

III. Use the supplied drain socket to connect drainage pipe.

IV. The unit must be installed in such a way that the condensed water can be flowed out smoothly.

Installation of ducts for MCC indoor unit

1) Air-supplying ducts

Two kinds of ducts are available, rectangular and round ducts (200mm).

Rectangular ducts are connected directly to discharge collar of indoor unit (Figure1).

Adding air-supplying adaptor to connect between indoor unit and round duct which elongating to the air-distribution box and length of round duct should not be more than 6 meters (Figure 2).

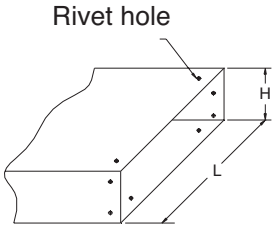


Figure 1 Connection for rectangular duct.

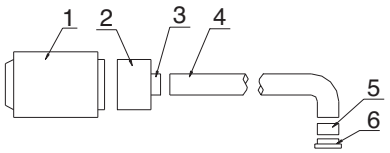


Figure 2 Connection for round duct.

Ducting sizes (mm)

Size: Dim / Model		MCC 010 M/MR	MCC 015 M/MR	MCC 020 M/MR	MCC 025 M/MR	MCC 030 M/MR	MCC 050 M/MR
Rectangular	L	747	847	960	960	1310	1570
	H	170	170	120	120	120	120
Round ∅		200	200	200	200	200	200

Item	Description of Figure 2
1	Indoor unit
2	Flexible connector or plenum box
3	Air-supplying adaptor
4	Round duct
5	Air-distribution adaptor
6	Air-distribution box

Model / Recommended	MCC010 M/MR	MCC015 M/MR	MCC020 M/MR	MCC025 M/MR	MCC030 M/MR	MCC050 M/MR
No.	1	1~2	2~3	3~4	3~4	3~5
Length (m)	6			8		
Area cooling space (m^2)	15~25	25~35	40~60	45-70	50~75	85~130

2) Air-returning duct (see Figure 3)

One end of air-returning duct can be jointed by a foldable canvas duct reinforced by 8" steel wire to make it easy to match different ceiling height.

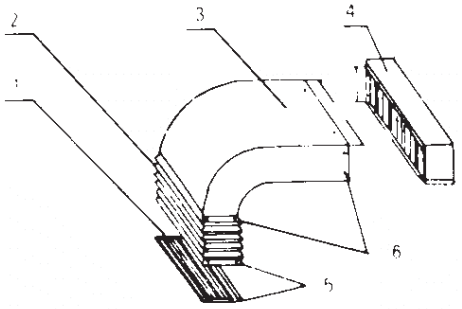


Figure 3. Connection for air-returning duct

Item	Description	Item	Description
1	Air-returning shutter	4	Indoor unit
2	Canvas duct	5	Wood screw
3	Air-returning duct	6	Rivet

3) Insulation (Figure 4)

It is necessary to put heat-insulated layer on the air-supplying duct and air-returning duct. Firstly, stick the glue anchor on the ducts. Then, cover the ducts with al-foil insulation fiber which should be fixed with glue anchor cover finally using the adhesive taper to seal the gap-line

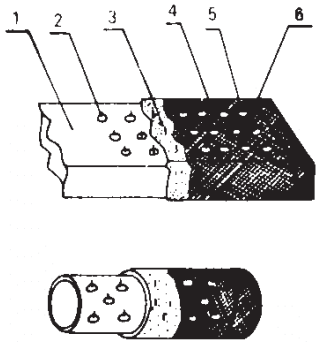


Figure 4. Insulation

Item	Description	Item	Description
1	GI plate	4	foil
2	Glue anchor	5	Glue anchor cover
3	Heat-insulation insulation layer	6	Glue taper

4) Others

- Each supply and return air must be fixed with supporting frame onto the ceiling of concrete prefabricate. The duct joint section should be sealed with glue.
- Returning air-box is suggested to be more than 150mm away from the side wall starting from outer edge of box.
- The obliqueness of level of drainage pipe should be taken into account about 1% degree.
- Drainage pipe should be wrapped with insulation fiber.

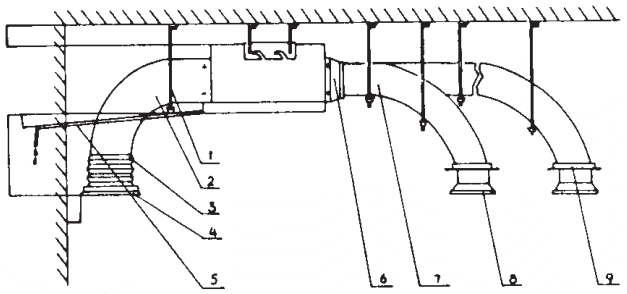


Figure 5. MCC installation of indoor unit

Item	description	Item	description
1	Hanger hook	6	Air-supplying adaptor
2	Air-returning duct	7	Air-supplying duct
3	Canvas duct	8	Distributing air duct
4	Air-returning shutter	9	Air-distribution adaptor
5	Drainage pipe		

Installation part list for MCC indoor unit (on customer's account)

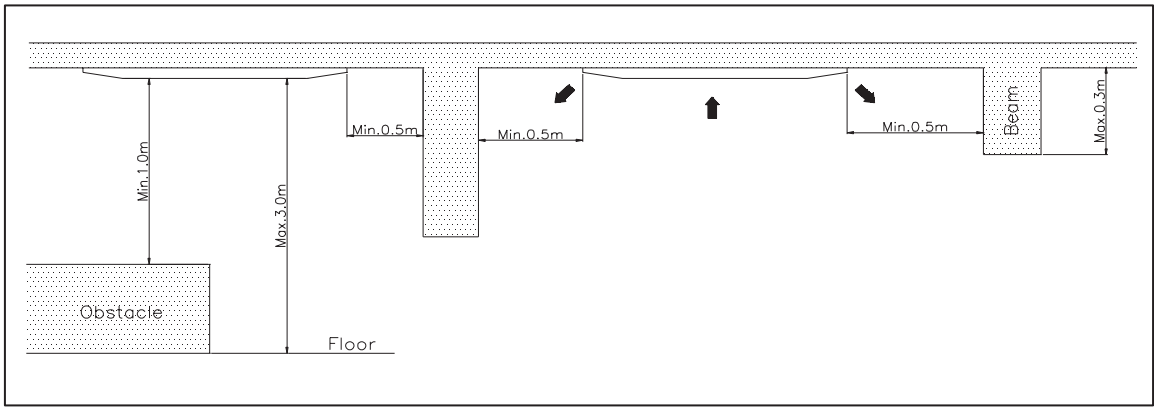
Suggested by manufacturer		Prepared by customer	
Item	**Description**	**Item**	**Description**
1	Air-supplying duct	1	Heat-insulation layer
2	Air-supplying adaptor	2	Glue anchor
3	Air-distribution box	3	Glue taper
4	Screw M6x30	4	Glue
5	Sealed gasket	5	Draw-in bolt
6	Air-returning duct	6	Copper tube heat-insulation
7	Electronic thermostat	7	Cable wire vv3*25
8	Air-distribution adaptor	8	Copper core wire bvv-1.5mm2
9	filter	9	Drainage pipe heat-insulation
		10	Hanging hook
		11	Tighten belt

The requiring amounts are according to the different unit and the field mounting conditions to ensure.

Installation of MCK unit

Preliminary site survey

- Electrical supply and installation is to conform to local authority's (e.g. National Electrical Board) codes and regulations.
- Voltage supply fluctuation must not exceed ±10% of rated voltage. Electricity supply lines must be independent of welding transformers, which can cause high supply fluctuation.
- Ensure that the location is convenient for wiring, piping and drainage.
- The indoor unit must be installed in such that free from any obstacles in path of cool air discharge and warm air return, and must allow spreading of air throughout the room (near the center of the room).
- Must be provided clearance for the indoor unit from the wall and obstacles as show in the figure.
- The installation place must be strong enough to support a load 4 times the indoor unit weight to avoid amplifying noise and vibration.
- The installation place (handing ceiling surface) must be assured the levelness and height in the ceiling is 350 mm or more.
- The indoor unit must be away from heat and steam sources (avoid installing it near an entrance).

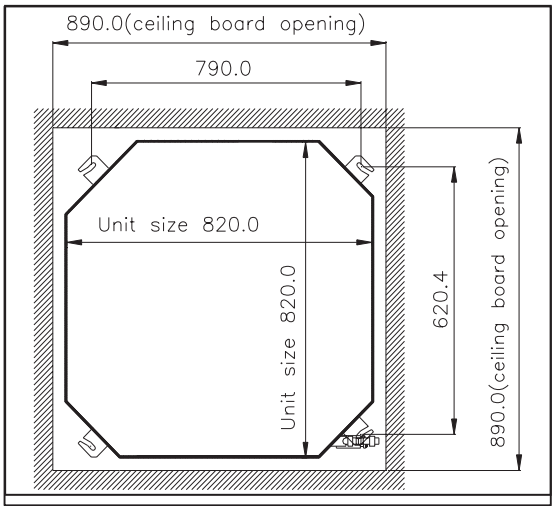


Unit Installation

- Measure and mark the position for the hanging rod. Drill the hole for the angle nut on the ceiling and fix the handing rod.
- The installation template is extended according to temperature and humidity. Check on dimensions in used.
- The dimensions of the installation template are as same as those in the ceiling opening dimensions.
- When ceiling lamination work is not completed, be sure to fit the installation template to the indoor unit.

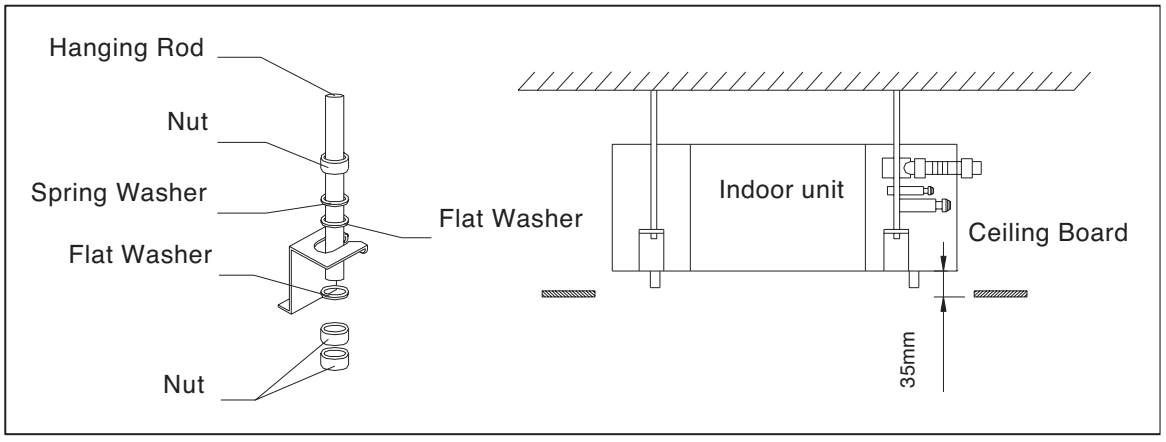
NOTE:
Be Sure to discuss the ceiling drilling work with the installers concerned.

Dimension in mm



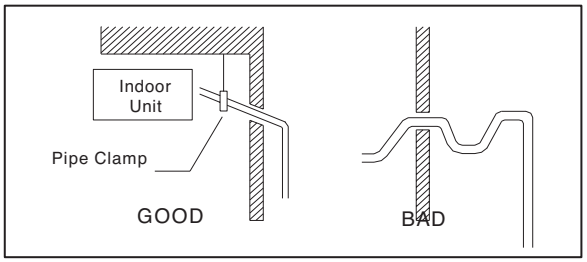
Unit Hanging

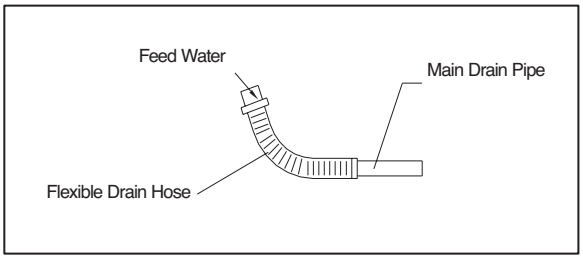
- Confirm the pitch of the hanging rod is 620.4mm×790.0mm sharp.
- Attach the hanger bracket with the nut and washer to the hanging rod. Hold the unit and hang it on the hanger bracket.
- Adjust the unit height to 35.0 mm between the indoor unit bottom surface and the ceiling surface.
- Confirm with a level gauge that the unit is installed horizontally and tighten the nut and bolt to prevent unit falling and vibration.
- Open the ceiling board along the outer edge of the paper installation template.



Drain Piping Work

- Drainpipe must be in downward gradient for smooth drainage.
- Avoid the drainpipe in up and down slope to prevent reversed water flow.
- During the drain piping connection, be careful not to exert extra force on the drain connector at indoor unit.
- The outside diameter of the drain connection at the flexible drain hose is 20mm.
- Be sure to execute heat insulation (polyethylene foam with thickness more than 8.0mm) on the drain piping to avoid the condensed water dripping inside the room.





Drain Test

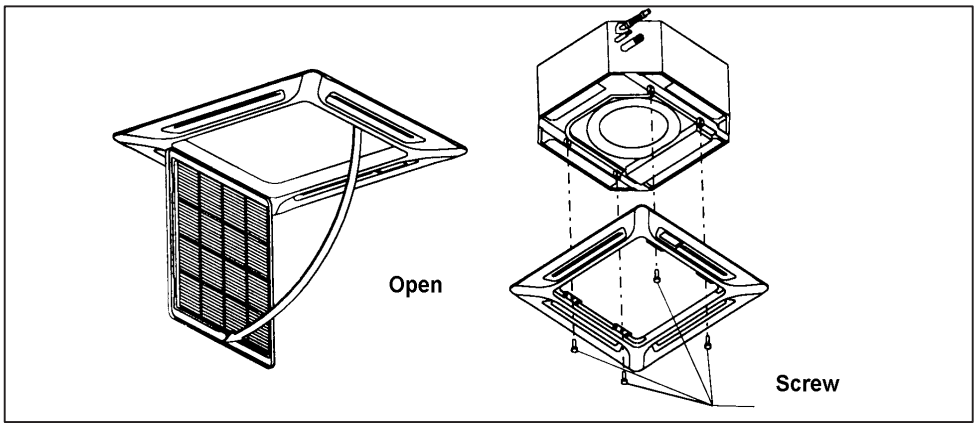
- Connect the main drainpipe to the flexible drain hose.
- Feed water from flexible drain hose and check the piping for leakage.
- When the test is completed, connect the flexible drain hose to the drain connector on the indoor unit.

NOTE:

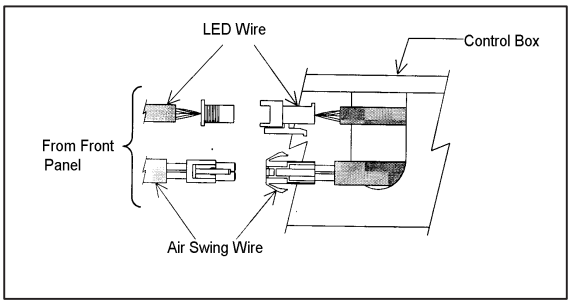
This indoor unit uses drain pump for condensed water drainage. Install the unit horizontally to prevent water leakage or condensation around the air outlet.

Panel Installation

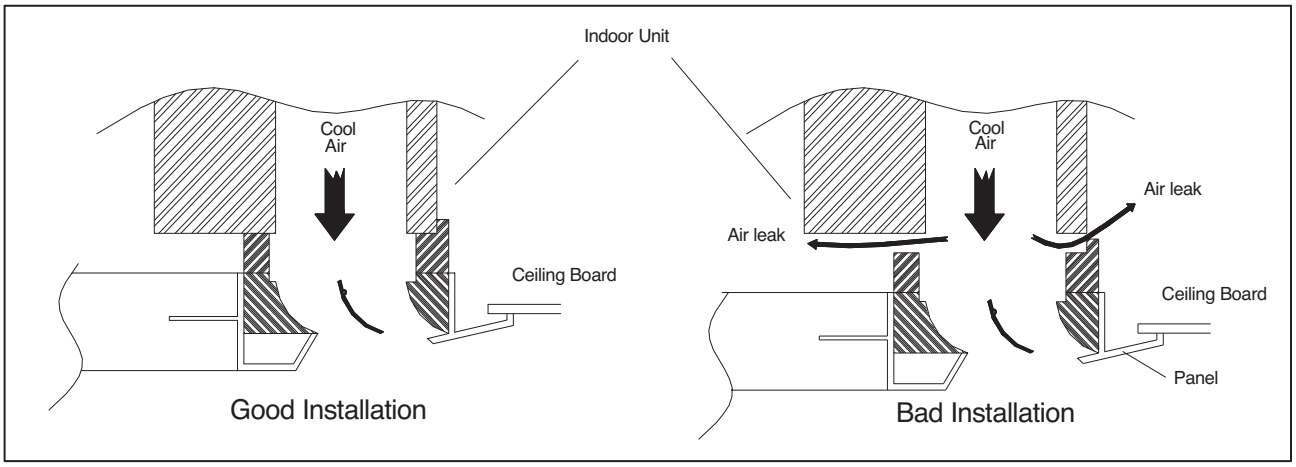
- The front panel can only be fitted in one direction, follow the piping direction. (Follow piping arrow sticker on front panel)
- Be sure to remove the installation template before installing the front panel.



- Open the air intake grille by pull back the catchers and remove it together with filter from panel.
- Install the front frame panel onto the indoor unit by 4 screw and tighten it completely to prevent cool air leakage.
- Connect the LED wire and air swing wire to the indoor unit.

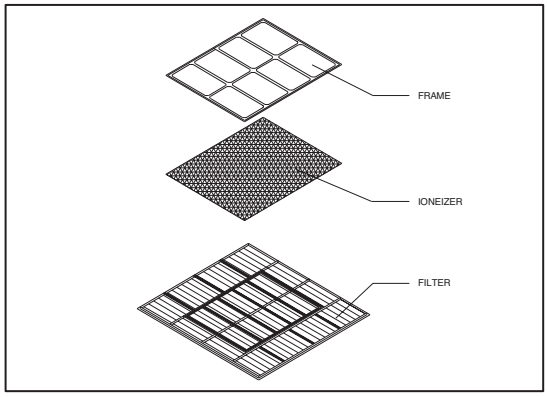


Note :
Install the front frame panel firmly to prevent cool air leakage which will cause condensation and water dripping



Air intake grille installation

- Before installed the air intake grille, be sure to fix the ionizer filter to the air filter.
- Fix the ionizer filter to the air filter with the black side on top and white side at bottom.
- Carefully clip on the ionizer filter frame.
- Install the air intake grille together with the air filter to the front panel.
- The grille can be fit in any direction, when selecting direction, the ceiling design and grille operability should be considered.



Installation of MCM unit

Preliminary site survey

- Electrical supply and installation shall conform to the local authority (e.g. National Electrical Board).
- Voltage supply fluctuation must not exceed ± 10% of the rated voltage. Electricity supply lines must be independent of welding transformers which can cause high supply fluctuation.
- Ensure that the installation location is convenient for wiring and piping.

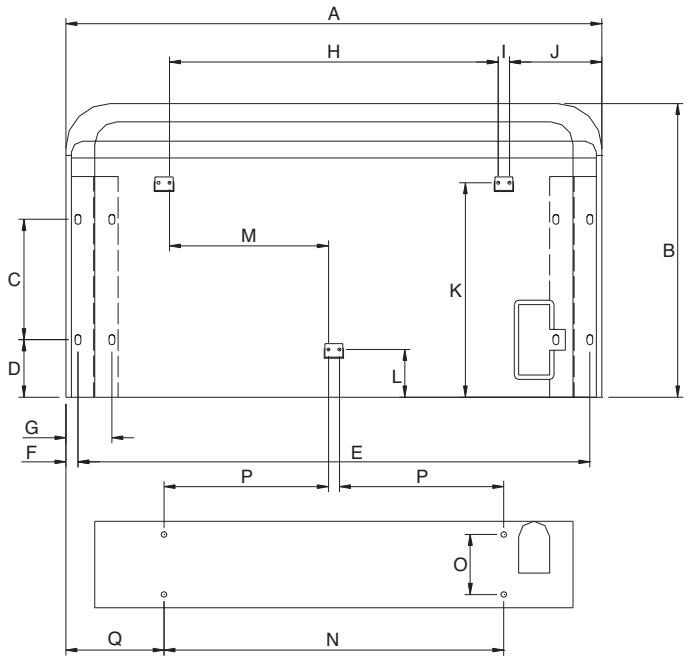
Standard Mounting

Ensure that the overhead supports are strong enough to hold the weight of the unit. Position the hanger rods (wall mounting bracket for floor standing) and check for its alignment with the unit as shown in Figure A. Also, check that the hangers are secured and the base of fan coil unit is leveled in both horizontal directions, taking into account the gradient for drainage flow as recommended in Figure A.

Note: Dimension in mm

MODEL	MCM020D	MCM030D	MCM050D
A	1214	1214	1714
B	666	666	666
C	273	273	273
D	130	130	130
E	1160	1160	1560
F	27	27	27
G	77	77	77
H	745	745	1235
I	25	25	25
J	209	209	331
K	486	486	486
L	108	108	108
M	360	360	600
N	770	770	1270
O	136	136	136
P	373	373	373
Q	222	222	310

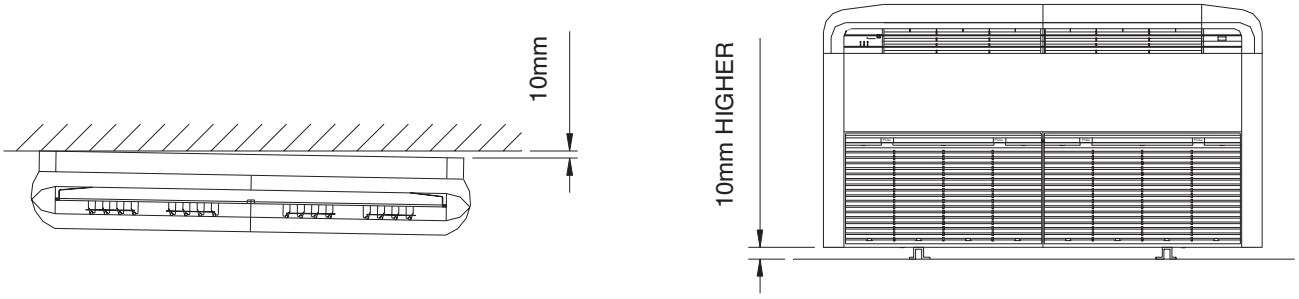
FIGURE A



Please ensure that following steps are taken:

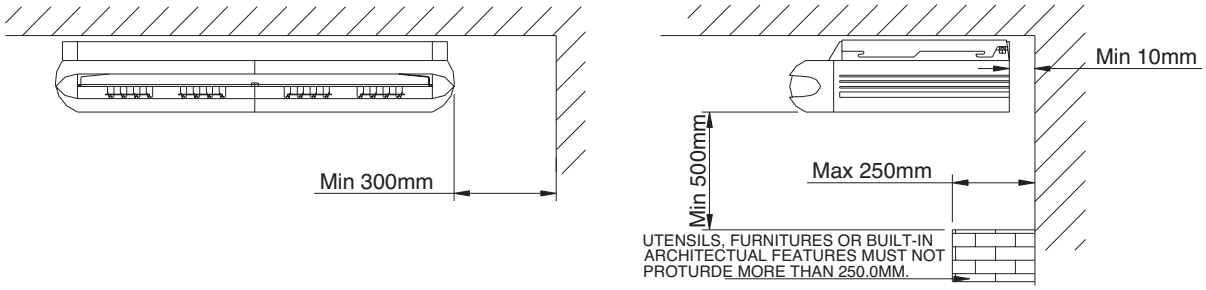
- Check the gradient for drainage flow as recommended in Figure B.
- Provide clearance for easy servicing and optimal air flow as shown in Figure C.

FIGURE B



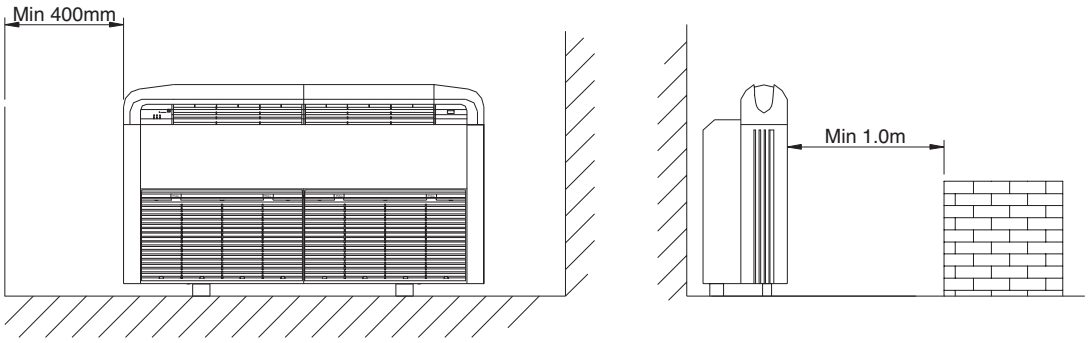
- The indoor unit must be installed such that there is no short circuit of the cool discharge air with the warm return air.

FIGURE C



CEILING EXPLORED TYPE

- Do not install the indoor unit where there is direct sunlight shining on the unit. The location should be suitable for piping and drainage installation. The unit must be a large distance away from the door.

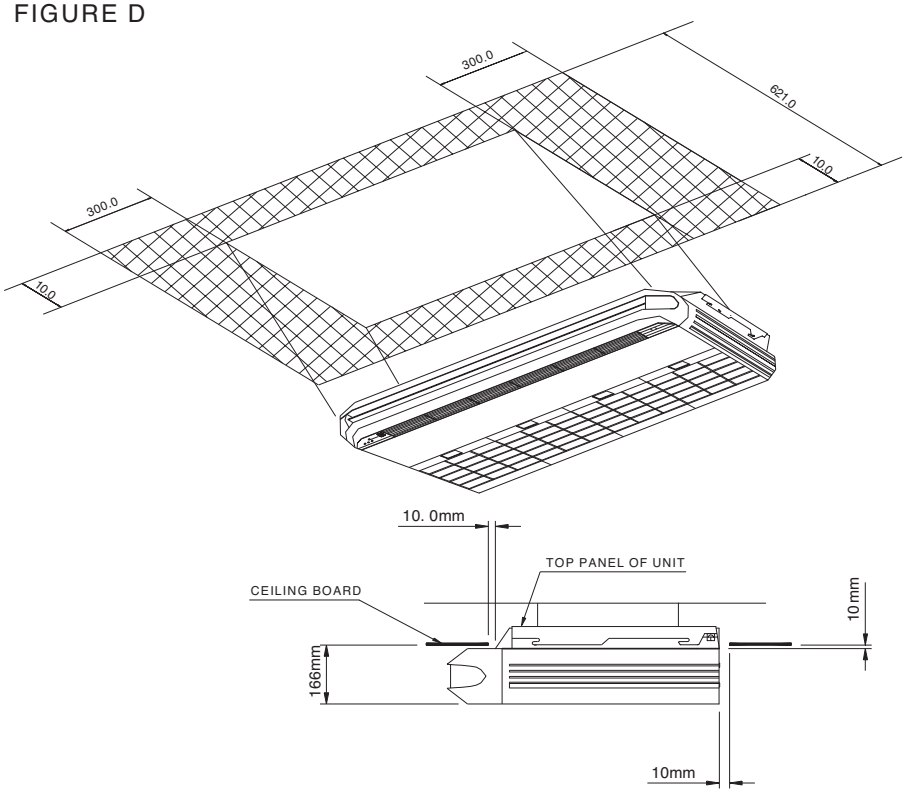


FLOOR STANDING TYPE

SEMI-ENCLOSE SCISSOR

- In case the unit is to be half-recessed into a false ceiling, please check that the unit is wellaligned.
- Provide the installation space as shown in figure D.

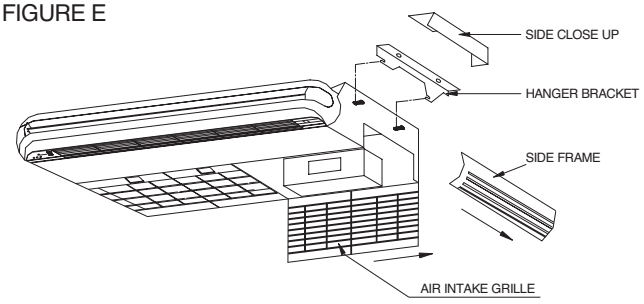
FIGURE D



STEP 1:

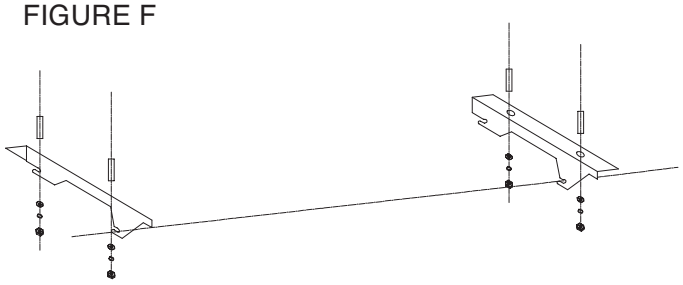
Remove the air intake grille, side panel, side close-up and hanger bracket from the unit. See Figure E.

FIGURE E



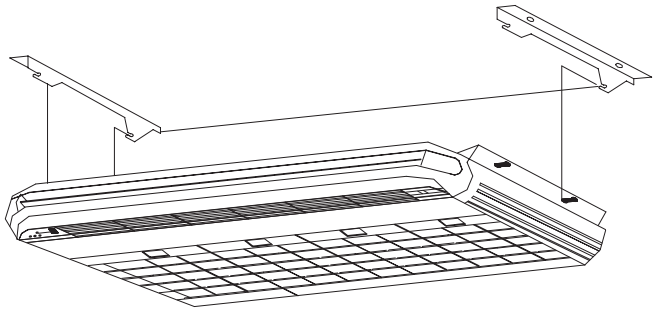
STEP 2:
Position the hanger rods as shown in Figure B, and install the hanger bracket.
See Figure F.

FIGURE F



STEP 3:
Hang up the unit and tighten the bolt. After completing the piping and draining pipe, install back the grille and panel.
See Figure G.

FIGURE G

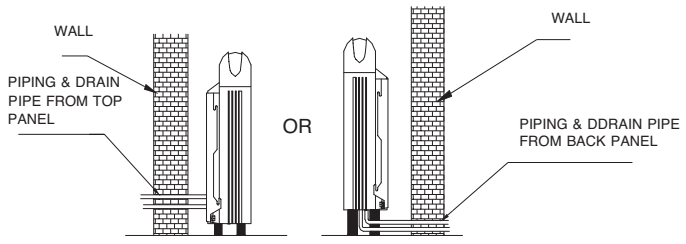


INSTALLATION-FLOOR STANDING TYPE

STEP 1:
Remove the air intake grille, side close-up and side panel from the unit. See Figure E.

STEP 2:
There are two types of piping and draining pipe connection, as shown in Figure H.

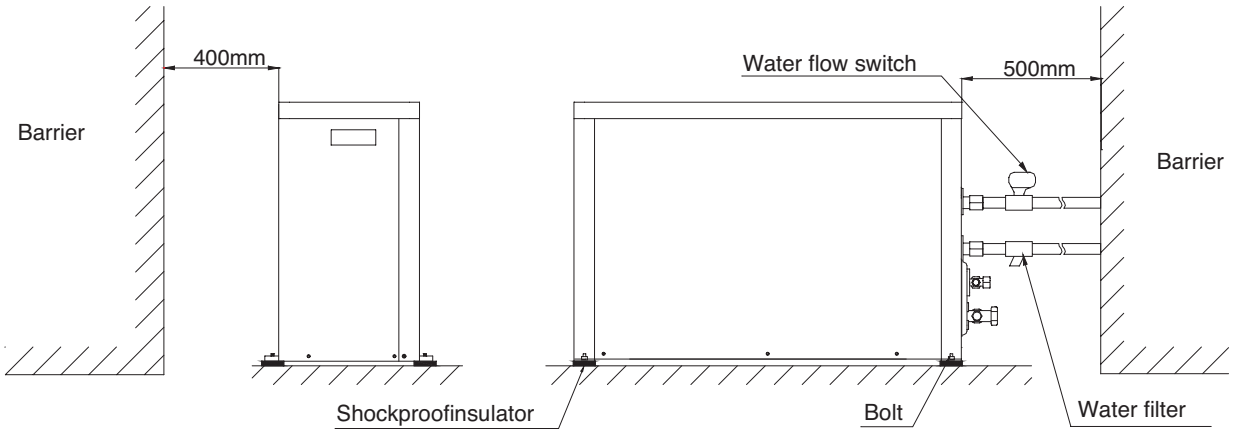
FIGURE H PIPING AND DRAIN PIPE INATALLATION



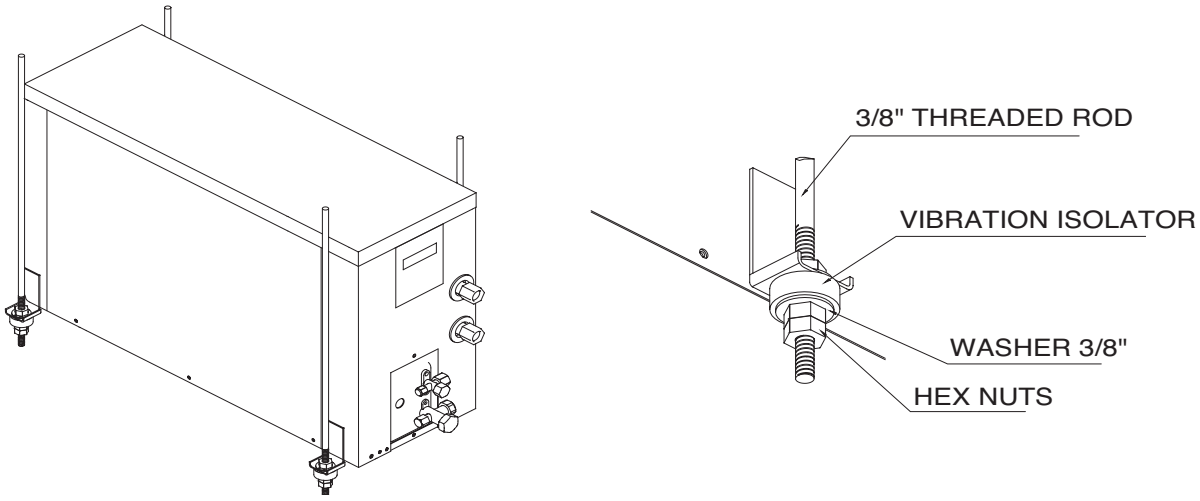
Installation Of Outdoor Unit

The location of the outdoor unit is very flexible, it can be installed in ceiling, stairs, toilet and out wall or other places. In order to operate the unit reliable, precaution steps:

1) Leave enough space for service person to perform maintenance of repair and provide sufficient room to make water, electrical connections.
2) The place can withstand the weight of the outdoor unit and isolate the noise and vibration.



3) If unit is suspended from the ceiling by four threaded rods. The rods are attached to the unit supportably by a hanger bracket through a rubber isolator.



Caution : Do not use rods smaller than specified above. The rods must be securely anchored to the ceiling or to the bar joist.

Refrigerant Piping Work

Refrigerant piping is important in particular. Refrigeration cycle of the split air conditioner is realized by the perfect piping work.

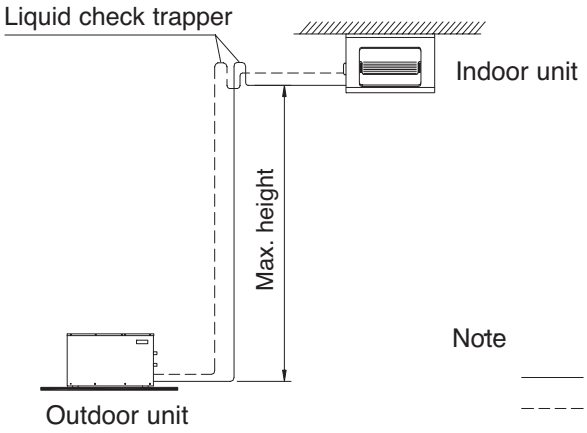
Piping length and elevation

If the piping is too long, both the capacity and reliability of unit will drop. As the number of bends increase, resistance to flow of refrigerant system increases, thus lowering cooling capacity and as a result the compressor may become defective. Always choose the shortest path and follow the recommendation as tabulated.

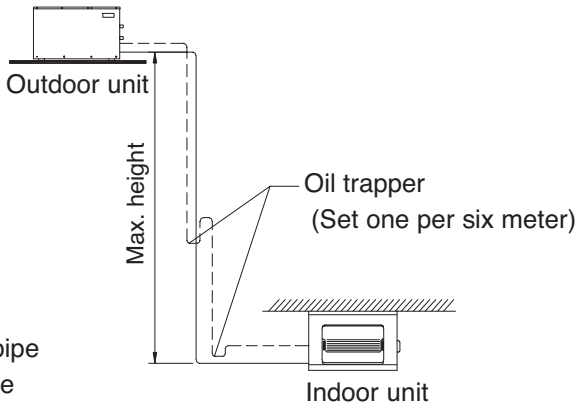
Model / Number	MWSC 010B/BR	MWSC 015B/BR	MWSC 020B/BR	MWSC 025B/BR	MWSC 030B/BR	MWSC 050B/BR
Max. Length, L	7m	10m	15m	15m	20m	20m
Max. Elevation H	5m	8m	8m	8m	10m	10m
Max. No. Of bends	10	10	10	10	10	10
Liquid pipe size	1/4”	1/4”	1/4”	3/8”	3/8”	3/8”
Gas pipe size	3/8”	1/2”	5/8”	5/8”	5/8”	3/4”

♦ For cooling unit, need to add external accumulator (recommended 6kg accumulator).

A. Outdoor lower than indoor unit



B. Outdoor unit higher than indoor unit



Note

——— Liquid pipe

– – – – Gas pipe

Installation of pipe

All system piping should be installed in accordance with local ordinances. The piping should be designed with a minimum number of bends and changes in elevation to keep costs to a minimum and unit performance to a maximum. A good installation should include the followings:

- Vibration eliminators to reduce vibration and noise transmission to the building.
- Shut-off valves are required to isolate the unit from the piping system during service.
- Manual or automatic air vent valve at the high points of the system.
- Some means to maintaining adequate system pressure (e.g. regulating valve and /or expansion tank)
- Install temperature and pressure indicators at the unit pipe to aid in servicing and troubleshooting
- Install a strainer to remove foreign matter from the water before it enters the pumps, it should be located far enough from the upstream of pump to prevent cavitation at the inlet.

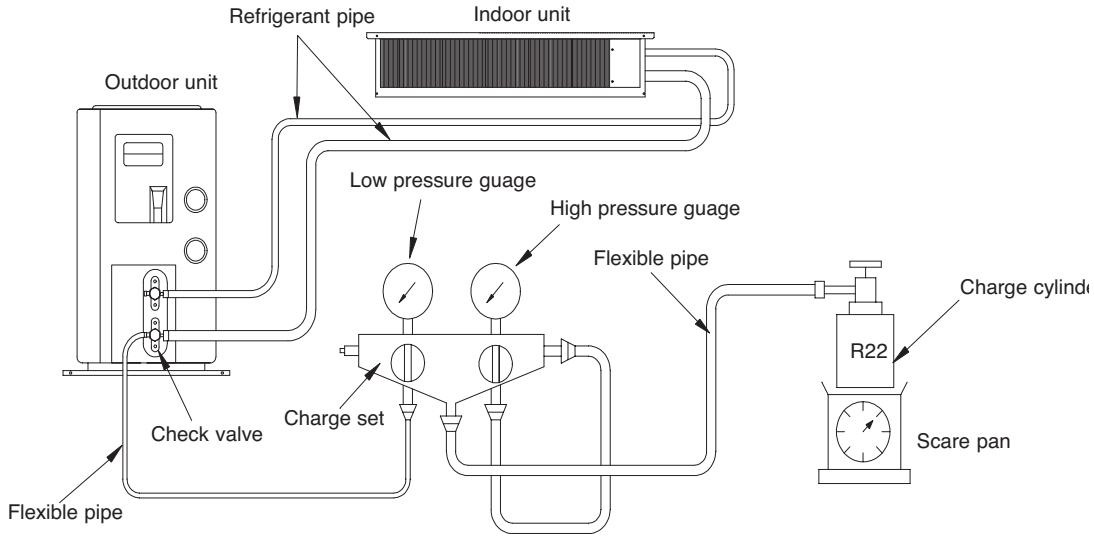
Piping Connection

1) Do not use contaminated or damaged copper tubing. If any piping, evaporator or condenser had been exposed or had been opened for 15 seconds or more, then vacuum and purge with field supplied refrigerant. Generally, do not remove plastic, rubber plugs and brass nuts from the valves, fittings tubing and coils until it is ready to connect suction or liquid line into valves or fittings.
2) If any brazing work is required, ensure that nitrogen gas is passed through coil and joints while the brazing work is being done. This will eliminate soot formation on the inside wall of copper tubing.
3) Cut the pipe stages by stages, advancing the blade of pipe cutter slowly. Extra force and a deep cut will cause more distortion of pipe and therefore extra burr.
4) Remove burrs from cut edges of pipes with a remover. This will avoid unevenness on the flare face which will cause gas leak.
5) Align the center of the piping and sufficiently tighten the flare nut with fingers. Finally, tighten the flare nut with torque wrench until the wrench clicks.
6) Be sure to execute heat insulation (polyurethane form with thickness more than 15 mm).
7) Except the outdoor unit which is pre-charged with refrigerant R22, the indoor unit and the refrigerant connection pipes must be purged because the air that contain moisture remaining in the refrigerant cycle may cause malfunction to the compressor.

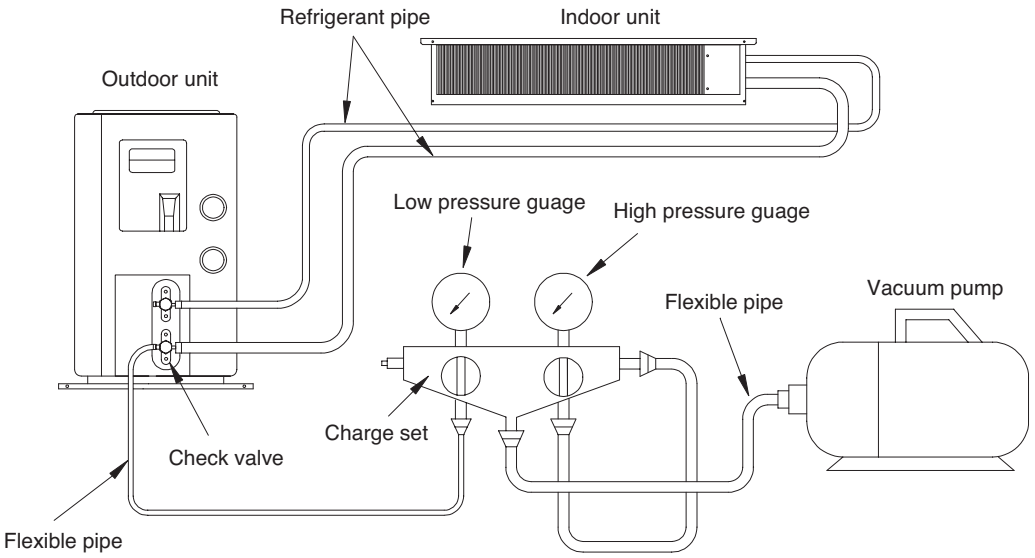
Vacuuming and charging

The precharged outdoor unit does not need any vacuuming or charging, However once it is connected, the connecting pipe line and the indoor unit need to be vacuumed before releasing the R22 from the outdoor unit.

1) Open the service port core cap.
2) Connect pressure gauge to the service port.
3) Connect the line to vacuum pump, open the charging manifold valve and turn the pump on, vacuum to -0.1MPa(-76cmHg) or lower (Evacuation time varies by the pump but averagely in 1 hour).
4) After evacuation, unscrew the spindle for the gas to run to indoor unit.

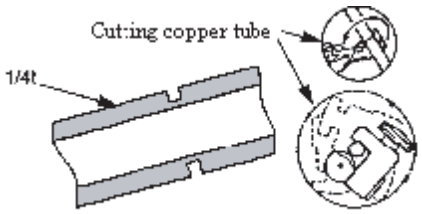


5) If system's refrigerant is leaked, recharge refrigerant referring to following diagram.



Piping Works & Flaring Technique

- Do not use contaminated or damaged copper tubing. If any pipings, evaporator or condenser had been exposed or had been opened for 15 seconds or more, then vacuum and purge with field supplied refrigerant. Generally, do not remove plastic, rubber plugs and brass nuts from the valves, fittings, tubing and coils until it is ready to connect suction or liquid line into valves or fittings.
- If any brazing work is required, ensure that the nitrogen gas is passed through coil and joints while the brazing work is being done. This will eliminate soot formation on the inside walls of the copper tubing.
- Cut the pipe stage by stage, advancing the blade of the pipe cutter slowly. Extra force and deep cut will cause more distortion on the pipe and thus extra burr. See Figure K.
- Remove burrs from cut edges of the pipes with remover as shown in figure L. This will avoid unevenness on the flare faces which will cause gas leak. Hold the end of the pipe downwards to prevent metal chips from entering the pipe.

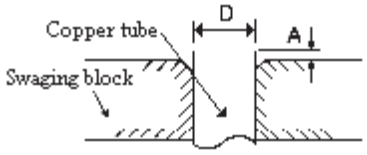


COPPER TUBE

FIGUREK

FIGUREL

- Insert the flare nuts, mounted on the connection parts of both the indoor unit and outdoor unit, onto the copper pipes.
- The exact length of pipe protruding from the face of the flare die is determined by the flaring tool. See Figure M. The table shows the use of an imperial die and rigid die.
- Fix the pipe firmly on the flare die. Match the centers of both the flare die and the flaring punch, and then tighten the flaring punch fully.



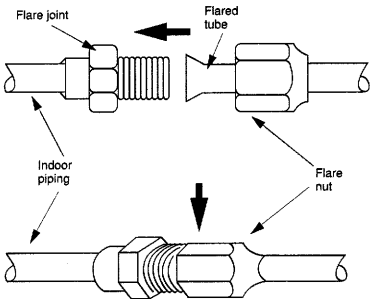
Piping Work & Flaring Technique

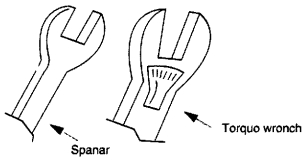
TUBE D		A (mm)	
Inch	mm	Imperial	Rigid
1/4”	6.35	1.3	0.7
3/8”	9.52	1.6	1.0
1/2”	12.70	1.9	1.3
5/8”	15.88	2.2	1.7
3/4”	19.05	2.5	2.0

Piping Connection To The Units

- Align the center of the piping and tighten the flare nut sufficiently with fingers.
- Finally, tighten the flare nut with the torque wrench until the wrench clicks.
- When tightening the flare nut with the torque wrench, ensure that the tightening direction follows the arrow indicated on the wrench.

PIPE SIZE mm (in)	Torque (mm)
6.35 (1/4)	18
9.52 (3/8)	42
12.7 (1/2)	55
15.88 (5/8)	65
19.05 (3/4)	78





Vacuuming And Charging Method

Purging the piping and the indoor unit

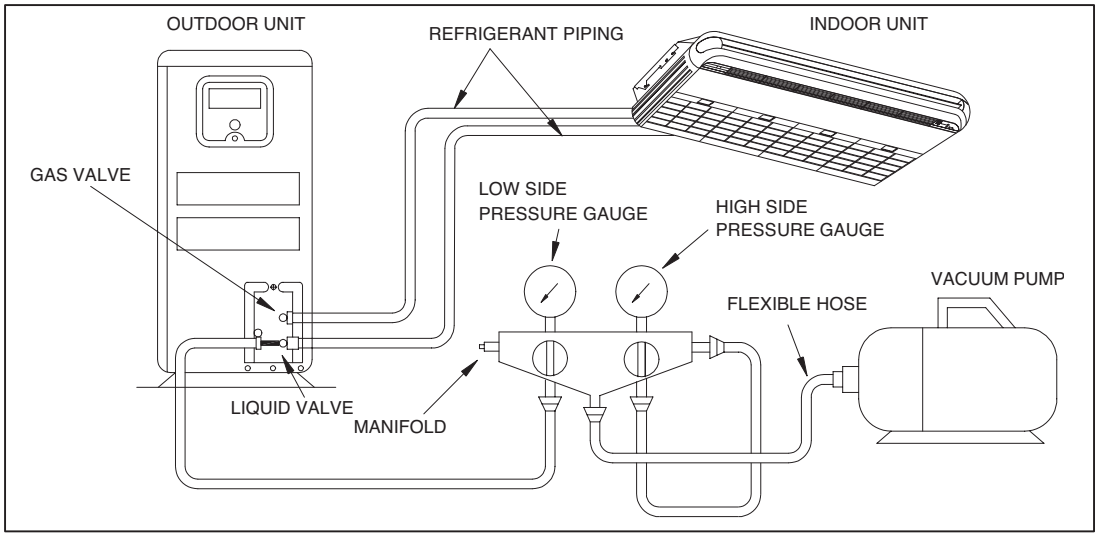
The outdoor unit is equipped by two 3-way refrigerating connecting valves. The suction valve is the larger one whereas the smaller one is the liquid valve. Both valves are supplied with service port valve for connection to a manometer.

- Remove the caps from the valve and the service port.
- Connect the center manifold gauge to the vacuum pump.
- Connect the manifold gauge to the service port of the 3-way valve.
- Start the vacuum pump. Evacuate for approximately one hour (evacuation time varies with pump capacity). Confirm that the manifold gauge needle has moved towards –30inHg (-76cmHg).
- Close the manifold valve and stop the vacuum pump.
- On the outdoor unit, open the suction valve and
- liquid valve (in anti-clockwise direction) with 4mm key for hexagon sacked screw.
- The air conditioner unit is now ready for start.
- Start the unit and run it for 10 to 15 minutes. The low pressure valve reading must be within the recommended value range as shown in the table.
- If the reading is within the indicated value range, the unit is running in good condition.
- If the reading is beyond the indicated value range, the refrigerant circuit has a leak. Check and seal the leak. Top up the charge if necessary.
- If the reading is close to the value 0, the refrigerant circuit must be evacuated (by using vacuum pump) and be charged (with R22) again.

MODEL	Indoor 27 °C /Outdoor 35 °C	
	kgf/cm2	Psi (=lbf/in2)
10	4.5 ~ 5.4	64.0 ~ 76.8
15	4.5 ~ 5.4	64.0 ~ 76.8
20	4.5 ~ 5.6	64.0 ~ 79.6
30	4.9 ~ 5.3	69.7 ~ 75.4
50	4.9 ~ 5.6	69.7 ~ 79.6

- Within the value
- Lower than the value
- Too low (˜ zero)

- refrigerant cycle normal.
- refrigerant cycle leaks. Check, repair and top-up.
- need evacuation and charge



Additional Charge

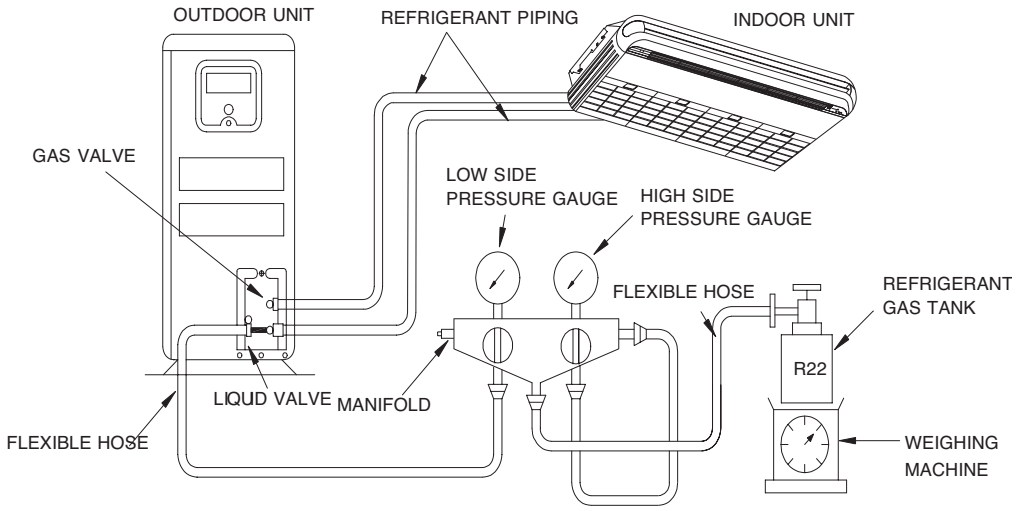
The refrigerant is pre-charged in the outdoor unit. If the piping length is less than 5m, then additional charge after vacuuming is not necessary. If the piping length is more than 5m, then use the additional charge valve as in the table below.

MODEL	R22 CHARGE (±5g/m)
MWSC 010 B/BR	22
MWSC 015 B/BR	22
MWSC 020 B/BR	22
MWSC 025 B/BR	25
MWSC 030 B/BR	50
MWSC 050 B/BR	60

Additional charge operation

The operation must be done by using gas cylinder and precise weighting machine obligatorily. The additional charge is top-up into the outdoor unit using the suction valve via the service port.

- Remove the service valve plug.
- Connect the low pressure manifold to the suction service port, center manifold to the cylinder tank and close the high pressure manifold (see figure below). Purge all the flexible hose with refrigerant gas.
- Start the air conditioner unit.
- Open the gas cylinder and low pressure manifold valve.
- When the required refrigerant quantity is pumped into the unit, close the low pressure manifold and the gas cylinder valve.
- Disconnect the manometer and the gas cylinder. Put back the service port cap.



Check refrigerant leak

Check whether there is a leak on the flare type connection of the indoor unit and the outdoor unit using a refrigerant detector,.

Hints : After operating the unit for some times, check whether there is any oil traces indicating there is a leak.

Overall Checking

Ensure that:
- The unit has been mounted solidly and rigid in position.
- The piping and connections are leak-proof after the charging.
- Proper wiring has been installed.

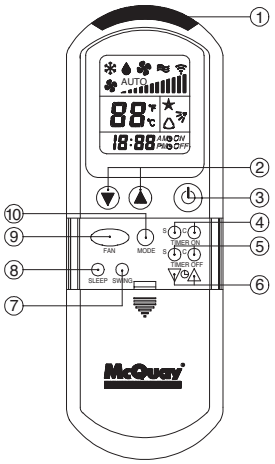
Drainage check
- Pour some water into the left side of the drain pan (the drainage is at the right side of the unit).

Test run:
- Conduct a test run on the unit after having perform the water drainage test and the gas leakage test.
- Check the following items:
- Is the electrical plug inserted firmly into the socket?
- Is there any abnormal sounds from the unit?
- Is there any abnormal vibrations on the unit or the piping?
- Is the drainage of water smooth?

Confirm that:
- The condenser fan is running. Check the warm air blowing from the condensing unit.
- The evaporator blower is running and discharge cool air.
- The suction (low side) pressure is as recommended.
- The remote controller incorporates a 3-minute delay protection in the circuit, whereby the outdoor condensing unit requires about 3 minutes delay before it can start operating.

Remote Control Operation Guide

Wireless Remote Control



1. Transmission source
- Source where the signal will be transmitted from.

2. Temperature setting
- Set the desired room temperature
- Press button to increase or decrease the set temperature. Setting range are between 16°C to 30°C (Optional setting from 20°C to 30°C)

3. "ON/OFF" switch
- Press to start the air conditioner unit.
- Press again to stop the unit.

4. Timer setting
- Press set button to activate the timer setting (from 1 hour to 15 hours) of the air conditioning unit. It will be in "ON" or "OFF" condition after the set time depending to the current condition (either from "ON" to " OFF" or vise versa).

5. Timer cancel
- Press to cancel the timer setting.

6. Clock
- To set the current time.

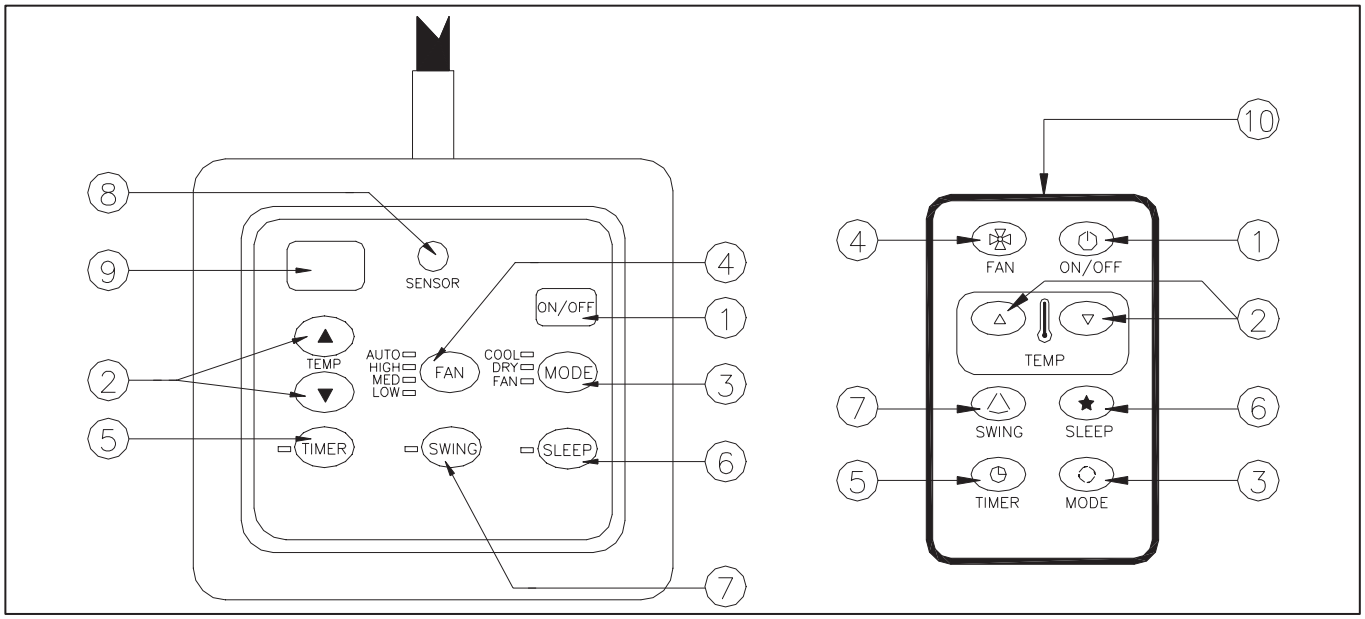
7. Automatic air swing
- Press the button to activate the automatic air swing function. The swing angle ranging from horizontal to 25°to bottom.

8. "Sleep" mode
- Press the button to activate sleep mode. This mode can only be activate while in cooling mode operation. It is activated in "COOL" mode, the set temperature will be increase 0.5°C after 30 minutes, 1°C after 1 hour and 2°C after 2 hours.

9. Fan speed selection
- Press the button until the desired fan speed is achieved.

10. Operation modes
- Press the "MODE" button to select the type of operation mode.
- Cooling unit: COOL, DRY, FAN

Wired Remote Control



1. "ON/OFF" switch
- Press to start the air conditioner unit.
- Press again to stop the unit.

2. Temperature setting
- Set the desired room temperature.
- Press button to increase or decrease the set temperature. Setting range are between 16 °C to 30 °C (60 oF to 80 oF)

3. Operation modes
- Press the "MODE" button to select the type of operating mode.
- Cooling Only:
- COOL, DRY, FAN

4. Fan Speed selection
- Press the button until the desired fan speed is achieved.

5. Timer
- Press the set button to select the switch timer of the air conditioner unit (the setting range is between 1 to 10 hours).

6. Sleep" mode
- Press button to activate the sleep function. This function can only be activated under "cool" mode operation. When it is activated under "cool" mode operation, the set temperature will increase 0.5°C after 30 minutes, 1 °C after 1 hour and 2 °C after 2 hours.

7. Air Swing
- Press button to activate the automatic air swing function.

8. Sensor
- Infra red sensor to receive signals from wireless controller.

9. LED display
- To display the set temperature (in °C) and timer delay setting (in hours).

10. Transmission source
- Source where the signal will be transmit from.

Standard Operation Conditions

Temperature	Ts (°C)	Th (°C)
Minimum indoor air temperature	19.4	13.9
Maximum indoor air temperature	26.7	19.4
Minimum outdoor air temperature	19.4	13.9
Maximum outdoor air temperature	46	24

Ts : Dry bulb temperature.
Th : Wet bulb temperature.

Start-up

Open all valves to full open position and turn on power to the conditioner.

1. Set mode to “Cool”. Set the cooling temperature to the coolest position. Again, many conditioners have time delays which protect the compressor(s) against short cycling. After a few minutes of operation, check the discharge grilles for cool air delivery. Measure the temperature difference between entering and leaving water. It should be approximately 1 1/3 times greater than the heating mode temperature difference. For example, if the cooling temperature difference is 6°C, the heating temperature difference should have been 5°C.
   Without automatic flow control valves, target a cooling temperature difference of 5°C to 8°C. Adjust the combination shut off/balancing valve in the return line to a water flow rate which will result in the 5°C to 8°C difference.
2. Set mode to “Heat”. Set the heat setting to the warmest selection. Some conditioners have built-in time delays which prevent the compressor from immediately starting. With most control schemes, the fan will start immediately. After a few minutes of compressor operation, check for warm air delivery at discharge grille. If this is a “cold building” start-up, leave unit running until return air to the unit is at least 18°C. Measure the temperature difference between entering and leaving air and entering and leaving water. With entering water of 16°C to 27°C leaving water should be 3.3°C to 6.6°C cooler, and the air temperature rise through the machine should not exceed 19°C. If the air temperature exceeds 19°C, then the water flow rate is inadequate.
3. Check the elevation and cleanliness of the condensate line. If the air is too dry for sufficient dehumidification, slowly pour enough water into the condensate pan to ensure proper drainage.
4. If the conditioner does not operate, check the following points:
   a. Is supply voltage to the machine compatible?
   b. Is thermostat type appropriate?
   c. Is thermostat wiring correct?
5. If the conditioner operates but stops after a brief period:
   a. Is there proper airflow? Check for dirty filter, incorrect ductwork.
   b. Is there proper water flow rate within temperature limits? Check water balancing; back flush unit if dirt clogged.
6. Check for vibrating refrigerant piping, fan wheels, etc.
7. Do not lubricate the fan motor during the first year of operation as it is lubricated at the factory.

Servicing And Maintenance

Warning

Disconnect from the main supply before servicing the air conditioner unit.

SERVICE PARTS	MAINTENANCE PROCEDURES	PERIOD
Indoor air filter	1.Remove any dust adhered on the filter by using a vacuum cleaner or wash in lukewarm water (below 40 °C) with neutral cleaning detergent. 2. Rinse well and dry the filter before placing it back onto the unit. 3.Do not use gasoline, volatile substances or chemical to clean the filter.	At least once every 2 weeks. More frequently if necessary.
Indoor unit	1.Clean any dirt or dust on the grille or panel by wiping it using soft cloth soaked in lukewarm water (below 40 °C) with neutral detergent solution. 2.Do not sue gasoline, volatile substances or chemical to clean the indoor unit.	At least once every 2 weeks. More frequently if necessary.
Condense drainpan & pipe	1.Check its cleanliness and clean it if necessary.	Every 3 months.
Indoor fan	1.Check for any abnormal noise.	When necessary.
Indoor / outdoor coil	1.Check and remove any dirt clogged between the fins. 2.Check and remove any obstacles that hinder air flowing into and out of the indoor / outdoor unit.	Every month. Every month.
Power supply	1.Check the voltage and current of the indoor and outdoor unit. 2.Check the electrical wiring for any faulty contacts caused by loose connections, foreign matters etc. Tighten the wires onto the terminal block if necessary.	Every 2 months. Every 2 months.
Compressor	1.No maintenance needed if the refrigerant circuit remain sealed. However, check for any refrigerant leaks at all joints and fitting.	Every 6 months.
Compressor oil	1.The compressor oil is factory-precharged. It is not necessary to add any oil if the circuit remains sealed.	No maintenance required.
Fan motor oil	1.All motor pre-lubricated and sealed at factory.	No maintenance required.

Pre Start Up Maintenance

After Extended Shutdown

- Inspect thoroughly and clean indoor and outdoor units.
- Clean or replace air filter.
- Clean condense drain line.
- Clean clogged indoor and outdoor coils.
- Check fan imbalance before operation and panels.
- Tighten all wiring connections and panels.
- Check for refrigerant leakage.

Maintenance

1. Normal maintenance on all conditioners is generally limited to filter changes. Lubrication of the fan motor is not required but may be performed to extend motor life. Use sae-20 non-detergent electric motor oil.
2. Filter changes are required at regular intervals. The time period between changes will depend upon the project requirements. Some applications such as motels produce a lot of lint from carpeting and linen changes, and will require more frequent filter changes. It is suggested that the filter be checked at 60-day intervals for the first year until experience is acquired. If light cannot be seen through the filter when held up to sunlight or a bright light, it should be changed. A more critical standard may be desirable.
3. The condensate drain pan should be checked annually and cleaned and flushed as requirement. 4. Recording of performance measurements of volts, amps, and water temperature differences (both heating and cooling) is recommended. A comparison of logged data with start-up and other annual data is useful as an indicator of general equipment condition.
5. Periodic lockouts almost always are caused by air or water problems. The lockout (shutdown) of the conditioner is a normal protective result. Check for dirt in the water system, water flow rates, water temperatures, airflow rates (may be dirty filter), and air temperatures, if the lockout occurs in the morning following a return from night setback, entering air below machine limits may be the cause.

Caution !

Do not charge oxygen, acetylene or other flammable and poisonous gases into the unit when performing a leakage test and air tighten test. These gases could result severe explosion and damage if in the high temperature and pressure. It is recommended that only nitrogen or refrigerant be charged when performing the leakage or air tighten test.

Cleaning & Flushing System

1. Prior to first operation of any conditioner, the water circulating system must be cleaned and flushed of all construction dirt and debris.
   If the conditioners are equipped with water shut off valves, either electric or pressure operated, the supply and return run outs must be connected together at each conditioner location. This will prevent the introduction of dirt going into the unit.
2. Fill up the system at the city water makeup connection with all air vents open. After filling, close all air vents. The contractor should start with main circulator by open the pressure reducing valve. Check vents in sequence to bleed off any trapped air, ensuring circulation through all components of the system.
   Power off the heat rejecter unit, and set the supplementary heat control at 27°C. While circulating water, the contractor should check and repair any leakage along the piping. Drain at the lowest point(s) in the system should be opened for initial flush and blow down, making sure city water fill valves are set to make up water at the same rate. Check the pressure gauge at pump suction and manually adjust the makeup to hold the same positive steady pressure both before and after opening the drain valves. Flush should continue for at least two hours, or longer if required, to see clear and clean drain water.
3. Shut off supplemental heater and circulator pump and open all drains and vents to completely drain down the system. Short circuited supply and return run outs should now be connected to the conditioner supply and return connections. Do not use sealers at the swivel flare connections of hoses.
4. Trisodium phosphate was formerly recommended as a cleaning agent during flushing. However, many states and localities ban the introduction of phosphates into their sewage systems. The current recommendation is to simply flush longer with 27°C warm water.
5. Refill the system with clean water. Test the water using litmus paper for acidity, and treat it as required to leave the water slightly alkaline (PH 7.5 to 8.5). the specified percentage of antifreeze may also be added at this time. Use commercial grade antifreeze designed for HVAC systems only. Do not use automotive grade antifreeze. Once the system has been filled with clean water and antifreeze (if used), precautions should be taken to protect the system from dirty water conditions. Dirty water will cause the in system wide degradation of performance and solids may clog the valves, strainers, flow regulators, etc. Additionally, the heat exchanger may be clogged which reduces compressor service life or causes premature failure. A System Saver® from McQuay International should be employed to continuously remove solids as the system operates. Contact your local representative for further information on this device.
6. Set the loop water controller heat add set point to 21°C and the heat rejection set point to 29°C and turn on all motors and start the circulating pumps. After full flow has been established through all components including the heat rejecter (regardless of season) and air vented and loop temperatures stabilized, each of the conditioners will be ready for check, test and start-up, air balancing, and water balancing.

Troubleshooting

When any malfunction of the conditioner unit is noted, immediately switch off the power supply to the unit. Check the following fault conditions and causes for some simple trouble shooting tips.

FAULT	POSSIBLE CAUSES
1. The compressor does not start operation after 3 minutes from starting the air conditioner unit.	• Protection against frequent starting. Wait for 3 to 4 minutes for the compressor to start operate.
2. The air conditioner unit does not operate.	• Power failure or the fuse need to be replaced.
	• The power plug is disconnected.
	• It is possible that your delay timer has been set incorrectly.
	• If the fault persist after all these verifications, please contact the air conditioner unit installer.
3. The airflow is too low. · The air filter is dirty.	• The doors or windows are open.
	• The air suction and discharge are clogged.
	• The regulated temperature is not high enough.
4. The remote control display is dim. · Battery flat.	• The batteries are place incorrectly.
5. Discharge airflow has bad odor.	• Odors may be cause by cigarettes, smoke particles, perfume etc. Which might have adhered onto the coil.
6. Condensation on the front air grille of the indoor unit.	• This is caused by air humidity after an extended long period of operation.
	• The set temperature is too low, increase the temperature setting and operate the unit at high fan speed.
7. Water flowing out from the air conditioner unit.	• Check the condensate evacuation
8. Hissing air v sound from the air conditioner unit during operation.	• Refrigerant fluid flowing into the evaporator coil.

If the fault persists, please call your local dealer / serviceman.

The LED indicator on the control panel:

FAN				MODE				SLEEP	LED	Status	Analysis
AUTO	HIGH	MED	LOW	COOL	DRY	HEAT	FAN				
OFF	ONLY	ONE	ON	ON	OFF	OFF	OFF	OFF	-	Normal	Cooling
ON	ONLY	ONE	ON	ON	OFF	OFF	OFF	OFF	-		Auto fan cooling
OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	-		Dry mode
OFF	ONLY	ONE	ON	OFF	OFF	ON	OFF	OFF	-		Heating
ON	ONLY	ONE	ON	OFF	OFF	ON	OFF	OFF	-		Auto fan heating
OFF	ONLY	ONE	ON	OFF	OFF	OFF	ON	OFF	-		Fan
ON	ONLY	ONE	ON	OFF	OFF	OFF	ON	OFF	-		Auto fan
OFF	ONLY	ONE	ON	ON	OFF	FLASH	OFF	OFF	-		Auto cooling
ON	ONLY	ONE	ON	ON	OFF	FLASH	OFF	OFF	-		Auto fan and auto cooling
OFF	ONLY	ONE	ON	FLASH	OFF	ON	OFF	OFF	-		Auto heating
ON	ONLY	ONE	ON	FLASH	OFF	ON	OFF	OFF	-		Auto fan and auto heating
OFF	OFF	OFF	OFF	FLASH	OFF	OFF	OFF	OFF	-	Fault	Compressor overload
OFF	OFF	OFF	FLASH	OFF	OFF	OFF	OFF	OFF	-		Room sensor missing
OFF	FLASH	OFF	OFF	OFF	OFF	OFF	OFF	OFF	-		Outdoor water sensor missing
OFF	OFF	FLASH	OFF	OFF	OFF	OFF	OFF	OFF	-		Indoor coil sensor missing
OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	FLASH	-		Refrigerant leak
-	-	-	-	-	-	-	-	-	FLASH		Water or compressor problem

By means of pressure readings:

PRESSURE			PROBABLE CAUSE
Data / Circuit	TOO LOW	TOO HIGH	
High pressure side Low pressure side		? ?	1. Overcharged with refrigerant; 2.Non-condensable gases in refrigerant circuit; 3. Too warm condenser water; 4. Insufficient water flow (cooling); 5. Outdoor coil dirty (cooling); 6. Air filter clogged/dirty (heating).
High pressure side Low pressure side	? 	 ?	1.Poor compression/no compression (compressor defective); 2.Reversing valve leak (heating).
High pressure side Low pressure side	? ?		1. Undercharged with refrigerant; 2. Refrigerant leak; 3. Too low evaporator water; 4. Insufficient water flow (heating); 5. Outdoor coil dirty (heating); 6. Air filter clogged/dirty (cooling).

The most common causes of air conditioner failure to "start" are:

1. Voltage fluctuation not within ±10% of rated voltage.
2. Power supply interrupted.
3. Control settings improper.
4. Air conditioner is disconnected from main power source.
5. Fuse blown or circuit breaker off.
6. Improper temperature of water loop (water temperature below 13 °C or above 43 °C).

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